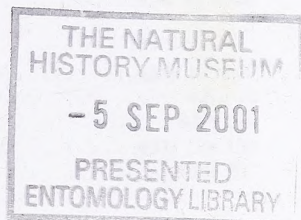


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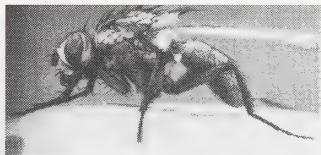


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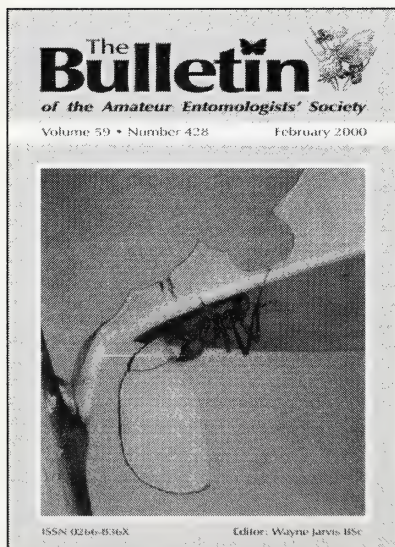
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AES Exhibition 2000

Kempton Park Racecourse

Saturday 7th October

11.00am - 5.00pm



The cover of the *Bulletin* features a forager of the ant *Acromyrmex octospinosus*

This species of ant is one of a number of South American leaf cutter ants (Order Hymenoptera, Family Attaphilidae). These ants cut pieces of leaf and carry them back to the nest. This action gives them their alternative name of "Parasol Ants". The ants compost the cut leaves and use this compost for the growing of fungus, which the ants feed on. The colony was the property of AES Bug Club member Scott Wilson, who gave it to the Registrar for photographic purposes.

Photo: Nick Holford.

The Bulletin

of the Amateur Entomologists' Society

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February 2000

Editorial

The Society's 2000 AGM and Members' Day is only a few weeks away, Saturday 15th April to be precise. We are again holding the meeting at the Natural History Museum in South Kensington, London. Although the programme has still to be finalised at the time of going to print, we are intending to hold a full programme to interest our adult and Bug club members throughout the day. The outline programme and how to get to the museum can be found at the rear of the *Bulletin*. Admission to the museum, which opens at 10am is free to those attending our event so we hope to see you there. Full details of the day will be available on the website nearer the time.

I was hoping to be able to include details of the Cribb Award for Invertebrate Conservation in this edition of the *Bulletin* but unfortunately space has not permitted me to do this. The Award is a new award by the Society to amateurs involved in conservation. I will include full details in the April *Bulletin* but if you can't wait until then check out the conservation pages at <http://www.theaes.org>.

Finally, a plea for help.

The Fauna of Britain project is currently searching for information about British insects relating to folklore (including old wives' tales, superstitions, ancient remedies involving them, towns and fields etc named after particular animals and why, and the regional names for each animal). The information is to be published in an upcoming book. If you can help please either contact me via post or e-mail and I will forward all information received to the project.

I hope to see you at the AGM.

Wayne





Stick-insects (Phasmida) from the Cape Town area, South Africa

by Paul D. Brock (4792)

"Papillon", 40 Thorndike Road, Slough SL2.1SR.

In an effort to at least locate the two species of stick-insects highlighted in Le Feuvre (1936), I visited Cape Town for ten nights in September 1998. Having checked the entomology collection at the South African Museum in Cape Town, examined type material in various museums, observed insects in the wild and reared them in captivity, the notes below aim to increase our knowledge of these insects, which I exhibited live at the AES Exhibition, October 1998. A key is provided to distinguish the three species definitely established in and around the Cape Suburbs – the third species, an introduced alien, was first reported in Brock (1999). Information on the three species follows, including details of synonyms (repeated descriptions); two new synonyms are given. The distribution details include a number of newly recorded localities, which are marked with an asterisk(*). Initials used in the foodplants and distribution sections relate to: PB – Paul Brock, HR – Hamish Robertson. Museum codes are given below:

BMNH Natural History Museum, London, U.K.

MHNG Muséum d'histoire naturelle Genève, Switzerland.

MNHN Museum National d'Histoire Naturelle, Paris, France.

NHMW Naturhistorisches Museum Wien, Austria.

RMNH Nationaal Natuurhistorisch Museum, Leiden, Netherlands.

SAMC South African Museum, Cape Town, South Africa.

UZIU Uppsala University, Zoological Museum, Uppsala, Sweden.

Key to males

1. Thin greenish brown insects. Antennae much shorter than fore femora.....2
Thin brown insect*. Antennae longer than fore femora. Body length 48.5-61mm*Carausius morosus*
2. Head and pronotum yellow with green bands; otherwise body mainly brownish green. Legs plain green. Cerci reddish brown, pincer-like. Body length 42-52mm.*Macynia labiata*



Head plain; pronotum and hind part of mesonotum and metanotum with conspicuous greenish blue and white patch, otherwise greenish brown. Legs green with brown band on base and apices of all femora. Cerci whitish, smaller. Body length 50-55mm.*Phalces longiscaphus*

* Unlikely to be found in South Africa – see description notes.

Key to females

(Note - colour forms may vary in each species)

1. Elongate insects with smooth thoraxes; end of abdomen with a long chute-like appendage. Body length 70-80mm.....*Phalces longiscaphus*
Broader, more robust insects with granulated thoraxes; end of abdomen lacking a long chute-like appendage. Body length 54-84mm.....2
2. Smaller species, plump. Usually green with yellow head and pronotum, with green bands; mouthparts and cerci pinkish red. Thorax slightly granulated. Antennae shorter than fore femora. Body length 54-56mm.*Macynia labiata*
Longer species, stick-like, plain green or brown. Thorax granulated. Antennae longer than fore femora. Body length 70-84mm.....*Carausius morosus*

Eggs – see Figure 1 below

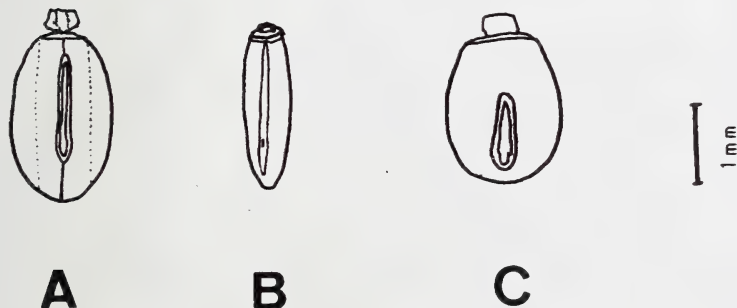


Figure 1. Dorsal outlines of eggs

a) *Macynia labiata*, b) *Phalces longiscaphus*, c) *Carausius morosus*



Thunberg's stick-insect

Macynia labiata (Thunberg) (Plate 00A)

Mantis labiata Thunberg, 1784: 61. Female type(s) – Locality not known (UZIÜ, Uppsala).

Phasma labiata (Thunberg); Thunberg, 1815: 299; Westwood, 1859: 183.

Macynia labiata (Thunberg); Stål, 1875: 103; Kirby, 1904: 332; Redtenbacher, 1906: 32.

Bacillus capensis Serville, 1838: 257. Holotype female, Cape of Good Hope "Cap-de-Bonne-Espérance" – Location of type not known, presumed lost. **New synonym**

(Listed as a synonym of *Leptynia graminea* (Bates, 1865) (from Natal) by Brunner, 1907: 230, in error. Although academic now, Brunner should have listed *capensis* as the valid name, as it had been described first).

Phasma (Bacillus) capense (Serville); de Haan, 1842: 137.

Bacillus capensis (Serville); Westwood, 1859: 5.

Clonaria capensis (Serville); Kirby, 1904: 338.

Bacillus stellenboschus Westwood, 1859: 5, pl. 2: 4. Holotype male, Cape of Good Hope (Promont. Bonae Spei) (BMNH, London). **New synonym**

Phthoa stellenboschus (Westwood); Kirby, 1904: 332.

Leptinia stellenboscha (Westwood); Brunner, 1907: 231.

Description: Male 42-52mm, female 54-56mm. Females are small, plump insects, whereas males are rather stick-like with long cerci; both sexes are slightly glossy and have short antennae. The male is slender, light brownish green, with dark green legs and antennae, and bold pincer like reddish brown cerci. The head and pronotum are yellowish with green bands. The female is plump and short, similar in length to the male. She has a yellow head and pronotum, with green bands; the antennae are green, except for the two yellow basal segments. The mouthparts and cerci are pinkish-red, along with end of mesonotum laterally, otherwise the body colour is usually a beautiful leaf green, with longitudinal cream side stripes from thorax to end of abdomen (Fig. 2). Occasionally, females reared in captivity are pinkish green. The thorax is slightly granulated.

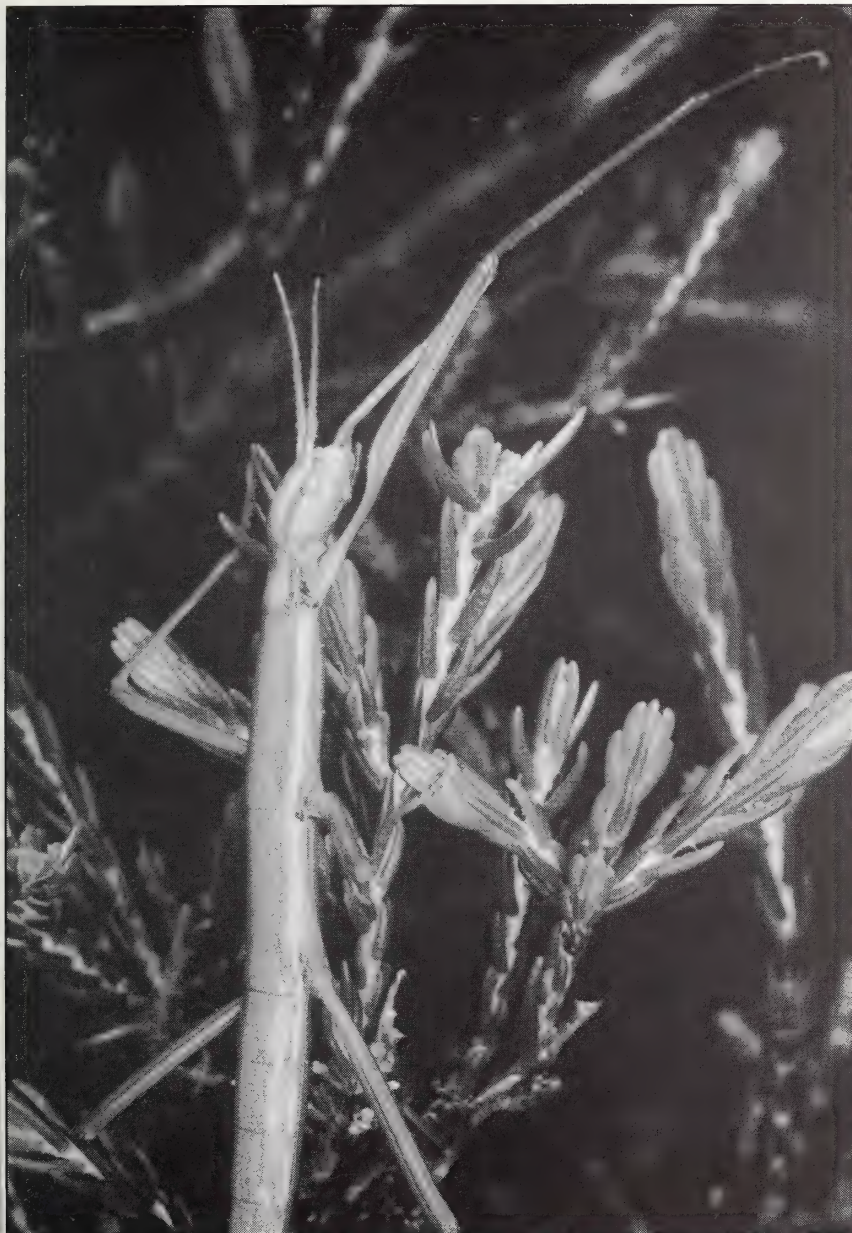


Figure 2. *Macynia labiata* – close-up of female.



Habits: These insects usually remain on their foodplants in the daytime and are well camouflaged, lying flat on a branch blending in with the leaves, or pushed right into the vegetation, leaving only a small part of the insect visible (Plate 00B). Mating takes place frequently, with different males. There is sometimes strong competition, with two or more males trying to mate with a female, until one male is successful. Even when handled very carefully, males release their hold immediately and quickly walk away (even though the females are clasped in a strong grip by the large cerci). Both sexes also emit a clear fluid from their mouthparts. Females sometimes curl their bodies; they frequently retain an egg at the end of their abdomens, ready to eject. The defensive behaviour outlined above does not prevent attacks by predators. When discussing this species and *Phalces longiscaphus*, Le Feuvre (1936) referred to predation by spiders, birds, lizards, mantids and parasitic flies (notably Tachinids), in addition to humans – gardeners who do not approve of insects on their *Leptospermum* hedges! I found one medium sized female *M. Labiata* nymph with a large white tachinid egg attached to the back of its head. Skaife (1954) commented that the red-winged starling feeds its young mainly on stick-insects and destroys them in large numbers.

Rearing notes: Fairly straightforward to rear in partly ventilated cages at a temperature of about 70°F (21°C): eggs hatch in about four to six months, nymphs mature in six months, making five moults and adults live about four months, dropping one to three eggs to the ground, daily. Females usually start egg-laying about three weeks after becoming adult. September to January is probably the best time to locate adults, which fits in with Skaife (1954) who states that egg-laying starts at the end of October and goes on until January, after which time spent insects die. He records nymphs hatching in April and May. However, having found young nymphs to adults in September, one assumes that adults may be found practically all year. The eggs, not quite round, are dark brown with a whitish grey band and large whitish capitulum. The brown micropylar plate is long and narrow. The bottom of the capitulum is cut into strips, prompting Le Feuvre to remark that under the microscope, these are like “cut glass or crystal”. I have sometimes observed a skin on top of the capitulum, which usually drops off.

Foodplants: *Leptospermum laevigatum* (Myrtaceae), *Erica aemula* (Ericaceae) (Le Feuvre, 1936); *Colpoon compressum* (Santalaceae) (HR); *Passerina* spp. (Thymelaeaceae), *Athanasia trifurcata* (Asteraceae), other unidentified *Erica*-like plants (PB). In captivity nymphs and adults



feed well on *Erica* spp. (Ericaceae) and are particularly attracted by the flowers, which they also devour, *Rubus fruticosus* (Rosaceae) and *Leptospermum scoparium* (Myrtaceae). Note – not observed on *Rubus* in the Cape Town area, although plants were not uncommon near the main foodplants.

Distribution: Five miles NE Aberdeen (Günther, 1956); Cape Suburbs (Le Feuvre, 1936), Cape Town, leg. Le Feuvre, i.1934 (SAMC); *Cape of Good Hope Nature Reserve (PB); *Chapman's Peak, 13.ix.1998 (PB); *Table Mountain Nature Reserve, Constantia Nek, 14.ix.1998 (PB); *grounds of Houtkapperspoort, Constantia Nek, 6.-14.ix.1998 (PB); Table Mountain, Blinkwater (Günther, 1956); *Vlakkenberg, Constantia Nek, 7.-12.ix.1998 (PB); *George, 14.i.1918 (BMNH); *Grootvadersbosch National Reserve, Langeberg, 21.x.1996, leg. S. Van Noort (SAMC); Hout Bay, Skoorsteenkop (Günther, 1956); Kirstenbosch Botanical Gardens (Le Feuvre, 1936, HR – mating pair 7.i.1990 Günther, 1956); *Koeberg Nature Reserve, 28.xi.1997 (SAMC); *Stellenbosch (McMahon & Fraser, "stick-insect" 1988). Also listed from Madagascar by Redtenbacher (1906), believed to be in error. PB's records range from 1st instar nymphs to adults.

Etymology/Notes: The species name *labiata*, means 'liplike'. This is one of the earliest described phasmids; Carl Thunberg (1743-1828) arrived in Cape Town in 1772 and stayed for almost three years, collecting plants and animals beyond the immediate vicinity of Cape Town. The exact type locality is, therefore, uncertain, but likely to be in the Cape Town area. Skaife called this phasmid the "Green stick-insect".

Cape Stick-insect

Phalces longiscaphus (de Haan) (Plate 00C)

Phasma (*Bacillus*) *longiscaphum* de Haan, 1842: 101. Syntype series: two females, Cape of Good Hope (Prom. bon. spei), leg. Horstok (RMNH, Leiden).

Bacillus longiscaphum (de Haan); Westwood, 1859: 5.

Phalces longiscaphum (de Haan); Kirby, 1904: 336.

Phalces longiscaphus (de Haan); Redtenbacher, 1906: 28.

Bacillus coccyx Westwood, 1859: 6, pl. 7: 5. Syntype series: two females, "Africa australi" (BMNH, London) (synonymised by Kirby, 1904: 336).

Phalces coccyx (Westwood); Stål, 1875: 102.



Description: Male 50-55mm, female 70-80mm. Very stick-like, medium-sized wingless insects with short antennae. The male is greenish brown, similar to the male of *Macynia labiata*, except that it has three bluish green marks and white bands on the pronotum, hind part of the mesonotum and metanotum. The legs are green, with a brown base and apical band on all femora. The cerci are whitish, smaller than those in *M. labiata*. Females are usually brown or grey, perhaps speckled; occasionally they are green. The abdomen ends in a boat-shaped chute-like appendage, which varies considerably in length (Favrelle, 1938 illustrates such variation). Usually, the appendage is about four times the length of the anal (last abdominal) segment, but may be much longer, or occasionally shorter.

Habits: This species mainly relies on its effective camouflage for protection. They hide in the daytime and are rarely seen, until evening when they return to foodplants. When disturbed, nymphs sway from side to side. Adults mate frequently producing a spermatophore (sperm sac). Compton & Ware (1991) reported that ants carry eggs of this species to their nests, using the capitulum (knob on the lid of the egg) in a similar way as elaisomes on seeds. The capitulum is removed and eaten without reducing egg viability. Le Feuvre (1936) had clearly observed this behaviour when commenting "...the ant begins its attacks even before hatching takes place by carrying off the eggs to its nest". However, he associated this behaviour with an attack, speculating that "At a later stage it pulls the newly-hatched insects to pieces to facilitate removal of its larder." In a later paper, Le Feuvre (1939) adds that ants are attracted to the spermatophore in mating pairs of this species; they remove the small whitish-green sperical objects to take back to the nest. He also observed that a female introduced to the cage was savagely attacked by another female, resulting in part of a leg being bitten off.

Rearing notes: This species was reared in France in the mid 1930's (Favrelle, 1938), where it was considered to be able to breed parthenogenetically, as well as bisexually; and in the U.K. in 1968 (Allan Harman, *pers. com.*). For rearing conditions see those for *Macynia labiata*. Le Feuvre (1936) reported that it takes nymphs six months to mature, after five moults, with nymphs often losing legs. Eggs are dropped to the ground by females; they are very glossy, dark brown with a lighter, but small capitulum; eggs are easily damaged and need to be handled carefully. A few eggs are laid each day and Le Feuvre noticed a bluish-grey membrane wrapped around some eggs, although I did not observe this. The females I found at Constantia Nek



commenced egg-laying in mid-September, about three weeks after maturing and died by the end of December, 1998. The abdomens of fresh adult females are very thin, but fatten up prior to egg-laying.

Foodplants: *Leptospermum laevigatum* (Myrtaceae), *Erica aemula* (Ericaceae) (Le Feuvre, 1936, who also mentioned the "Yellow-wood tree" (likely to be a *Podocarpus* species, probably *P. latifolius*), although it was not clear in connection with this or the previously mentioned species); *Rhus* spp. (Anacardiaceae) (HR); *Passerina* spp. (Thymelaeaceae) (PB, HR), *Rubus fruticosus* (Rosaceae) (PB), *Liparia splendens* (Leguminosae) (PB). In captivity feeds well on *Erica* spp. (Ericaceae), *Rubus fruticosus* (Rosaceae) and *Leptospermum scoparium* (Myrtaceae). Favrelle (1938) also refers to *Rosa* spp. (Rosaceae), *Quercus* spp. (Fagaceae) and *Tradescantia* (Commelinaceae).

Distribution: *Harold Porter Botanical Gardens, Betty's Bay, 9.ix.1998 (1st and 2nd instar nymphs, 12mm & 20mm respectively) (PB); Bloukrans River, 20 miles ENE Plettenbergbaai (Günther, 1956); Cape Suburbs (Le Feuvre, 1936); Cape Town (BMNH); *Cape of Good Hope Nature Reserve (PB); Cape Peninsular, leg. Lightfoot, vi.1913 (SAMC); Table Mountain Blinkwater (Günther, 1956); *Cedarberg (SAMC); Claremont (Günther, 1956); *grounds of Houtkapperspoort, Constantia Nek, 8.-14.ix.1998 (PB); Hout Bay (Günther, 1956); Kirstenbosch Botanical Gardens (Le Feuvre, 1936); *Kleinmond, 9.-21.ii.1993 (HR); Grahamstown (Compton & Ware, 1991); Langebaan (Günther, 1956); Maanschijskop, seven miles E Hermanus (Günther, 1956); *Stellenbosch (BMNH). Redtenbacher (1906) also lists "Ostafrika (Westwood), Grusien, Azkur coll. m." (coll. m = Brunner's collection in Wien). Günther, 1956 lists it from Royal Natal National Park, Tugela Valley, Natal. PB's records all adults or last instar nymphs, except where stated.

Etymology: The species name means long boat-shaped; referring to the "chute" at the end of the abdomen. The Cape Stick-insect is an appropriate common name for this widespread species.

Laboratory or Indian Stick-insect

Carausius morosus (Sinéty) (Plate 00D)

Dixippus morosus Sinéty, 1901: 7. Syntype series: males, females (number not known), India: Pulney (Palni) Hills, Shembaganur (believed to be lodged in MNHN, Paris, including in separate Pantel collection). (Even though he was using a "manuscript" name



Dixippus morosus, as advised to him by the well known scientist Karl Brunner von Wattenwyl, Sinéty is considered the author of this species, because he used the name *morosus* before Brunner's description in 1907).

Carausius morosus (Sinéty); Brunner, 1907: 268.

Description: Male (rare) 48.5-61mm, female 70-84mm. Usually parthenogenetic, stick-like, medium-sized wingless insects with medium length antennae, usually dull green or brown, in various shades and sometimes with darker mottling. In adult females the inside base of the leg is bright red. The thorax has a number of small tubercles (knobs). The thinner, shorter males are brown, sometimes with reddish markings on the thorax. It is believed that those reared in captivity are genetic females with male characteristics, but sterile, which are more frequent when these insects are kept at unusually high temperatures.

Habits: These insects remain motionless for hours on end. Early researchers referred to the pencil-like attitude of these insects as a hypnotic trance, trauma or catalepsy; this involves the front legs being held forward protecting the antennae, with the mid and hind legs held tightly to end beyond the abdomen, which lasts up to five hours. This behaviour is a form of feigning death; normal activity can be resumed by blowing on the insect, or gently touching the legs. When disturbed, nymphs and adults may sway from side to side; in the wild this could resemble a twig swaying in the wind. Specimens which drop to the ground use the claws on their legs to cling onto a suitable surface, from which they may be seen swaying. As part of the defence reaction insects may discharge a fluid from the mouthparts.

The colour of these insects is affected by various factors, including foodplant, light and humidity. For instance, specimens fed on *Forsythia* and *Rhododendron flavum* become very yellow.

Rearing notes: Easy to rear at room temperature, without any special heating, water droplets are appreciated by nymphs and adults. The eggs are round, brown with a yellow knob, which hatch into fragile-looking brown nymphs. The following details are based on keeping the insects at about 70°F (21°C): eggs hatch in four to six months, nymphs mature in four to seven months, making six moults and adults live four to six months, dropping several hundred eggs to the ground. Females usually start egg-laying about two weeks after becoming adult. A cage with some ventilation is preferred, but practically any cage is suitable.



Foodplants: In Cape Town suburbs on ivy *Hedera* sp. and probably many other plants. In captivity, most commonly fed on privet *Ligustrum* sp., but will accept numerous plants.

Distribution: A native of India: Palni Hills, Shembagonor and Trichinopoly in Madura province. "Alien" specimens have been reported from countries such as England (various localities), U.S.A. (San Francisco, California) and Cape Town suburbs, South Africa – including Constantia Nek, 13.ix.1998 (Brock, 1998). Previously linked with the "Cape Flats" by a sketch in McMahon & Fraser (1988). They also occur in other parts of Europe, where they have either been deliberately released or have escaped from culture stocks. In favourable climates, they may breed; it is considered that the South African colonies may have originated from Le Feuvre's culture stock in the 1930's (Brock, 1999).

Etymology: Presumably the rather plain appearance of this insect prompted Brunner to select the Latin word *morosus*, meaning gloomy.

Other species reported from the Cape Province

My initial research concentrated on any species described or subsequently associated with either Cape of Good Hope (= Promont. Bonae Spei) or the Cape Town area. The type locality of *M. labiata* and possibly *P. longiscaphus* is almost certainly Cape Town, or nearby. However, the "Cape of Good Hope" was used to refer to anywhere in the Cape Peninsular i.e. between Cape Town and Grahamstown. The following species should be found somewhere in the Cape Province and, have perhaps so far gone unnoticed in the Cape Town area. I have excluded a few other species described from "South Africa" from this listing, as they may originate from any of a number of countries.

Prisomera canna (de Haan, 1842): 101 (*Phasma* (*Bacteria*) *canna*).

Syntype series: male, female, Cape of Good Hope (Promont. Bonae Spei) (RMNH, Leiden).

(Note – it is possible that this long species is South American (like *Prisopus horstokkii* – see below. It is definitely not a *Prisomera* species, although Brunner (1907) transferred it to that genus).

Paraleptinia schultbessi Carl, 1913: 21, pl. 1: 7-8. Holotype female, Cape of Good Hope (Promont. Bonae Spei) (MHNG, Geneva).



Gratidia pulchrepecta Carl, 1913: 22. Holotype male, Cape of Good Hope (Promont. Bonae Spei) (MHNG, Geneva).

Bactricia irregularis Brunner, 1907: 330. Holotype female, Cape of Good Hope, leg. Thorey (NHMW, Wien – coll. no. 673).
(This is an elongate, 170mm species).

Zehntheria mystica Brunner, 1907: 233. Holotype female, Cape of Good Hope (Promont. Bonae Spei) (MHNG, Geneva).
(Note – there is a specimen from Clanwilliam in SAMC, otherwise only known from the 73mm type specimen).

Leptynia annulata (Westwood, 1859): 14, pl. 7:6 (*Bacillus annulatus*). Holotype male, Locality not known (BMNH, London).
(Stål, 1875 listed it from Cape Town in error (in Brunner's collection); repeated by later authors).

Prisopus horstokkii (de Haan, 1842) from South America (French Guiana and Guyana) was described from "Prom. bonae spei", in error. The holotype female is deposited in the RMNH, Leiden.

I expected to see a few of the commoner South African insects in captivity in 'Butterfly World', Klapmuts, near Cape Town. However, the only stick-insects on display were the Australian *Extatosoma tiaratum* (Macleay), which had been obtained from a Malaysian contact, along with other Malaysian insects.

Acknowledgements

The author would like to thank Christopher Nissen (France) (translation from French literature), curators of the various museums mentioned, particularly H.G. Robertson (South African Museum, Cape Town) for access to the collection, details of foodplants and other information he had recorded for phasmids in the Cape Town area; and for constructive comments on a draft of this article.

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Only the more recent references are listed below. References to the original descriptions/major literature cited may be found in my AES book *The Amazing World of Stick and Leaf-insects*, published in 1999.

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Slugs, snails and sugaring

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During the wet summer of 1998 the slug and snail populations doubled and tripled in my area. Derek Heath and I spent many nights sugaring in his back garden. The problem was the sheer numbers of Roman or Edible snails (*Helix pomatia*) on the sugared patches. Derek had introduced this species many years ago to his garden from the Ironbridge area of Shropshire. Only around a dozen had been introduced, but the numbers soon grew, possibly due to the fact that the number of predators such as thrushes (*Turdus*) have declined markedly in recent years.

The snails climbed up the sugared trees and posts and the moths avoided these areas. Slugs and Garden snails (*Helix aspersa*) also joined in the feast. No doubt the amount of mucus from these creatures on the sugared areas had put the moths off feeding there. The following day we used scrubbing brushes with hot soapy water to the affected areas, and re-sugared the same night – the results were much better with plenty of moths around until midnight before the snails and slugs returned. On doing so, the moth count just fell. So again, scrubbing took place the following day.

During the autumn and winter we hunted for hibernating Roman snails under bricks and other suitable places. Around three hundred were found.



Western Algarve revisited

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I read with interest Don Dunkin's article in the December 1999 edition of the *Bulletin* Volume 58 (427) on "The Western Algarve revisited – March/April 1999". I spent the October schools' holiday week (10th–17th October) in Villa Maura, Portugal and found that the commonest butterfly was the Geranium bronze (*Cacyreus marshalli*). It was everywhere and larvae were easy to find on *Pelargonium* flower heads. Judging by the numbers present, it is well established in Portugal. I saw very few other species: all three whites (in ones and twos), clouded yellow (*Colias croceus*) – one fresh female, Long-tailed blue (*Lampides boeticus*) – two individuals, just about sums it up.

I received *Living Britain – A Wildlife celebration for the Millennium* as a Christmas present. There are some nice references to butterflies, especially the page on the British Swallowtail (*Papilio machaon britannicus*), but what a shame the person who wrote the captions for



Figure 1. French hawk moth on a Slipper orchid.

the photos of the Silver-washed fritillary (*Argynnis paphia*) and the Large elephant hawk moth (*Deilephila elpenor*) didn't check with an expert before writing the captions. "The distinctive bars on (the) forewings" of a male Silver-washed fritillary are not visible when it has its wings closed! Also, the Elephant hawk is clearly resting, not "feeding" on the honeysuckle flower. I enclose a photograph (Figure 1) of a French hawk moth (*Proserpinus proserpina*) resting on a slipper orchid (*Cypripedium calceolus*).



Sardinia 1999

by M. J. Dawson (9130) and J. Hemmings (10628)

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The Ascalaphid indigenous to Sardinia and Corsica is the *Ascalaphus corsicus* (Plate 00E). We preferred the former island as it belongs to Italy, where things are more civilised and there are few, if any, restrictions on entomologists. We were there during the last week of June and the first week of July.

The plane landed before midday. Hiring a car (expensive: £750 for two weeks) we drove north up the S131, branching off on to the S197 towards the Gennargentu mountains. Before reaching Laconi, a dry, grassy field with a slightly greener area at one end looked suitable territory. We put up four *A. corsicus* – less than two hours after arrival.

We stayed at Aritzo, near the centre of the Gennargentu mountains. *A. corsicus* was seen in many areas, mostly on dry grassland. Near Meana Sardo, on a steep hillside with quite thick vegetation (Plate 00F), we found not only *A. corsicus* but another Ascalaphid, *Theleproctophylla australis*, both in quite large numbers. On 1st July we travelled to the south-east corner of Sardinia, staying at Villaputzu. We searched all this area but found no more *A. corsicus*. However, *Th. australis* was seen in many areas.

The weather was extremely warm, the hottest day reaching 45°C (113°F) at midday. Practically no insects of any species were flying in that heat. Only on the last day did it rain, with thunder and lightning. The rain while driving though the small village of Gesturi was so heavy that the house down-pipes could not take the flow and water gushed from the roofs in sheets. Within a few seconds, the water was three inches deep in the road.

The dates of our stay were a little late for seeing butterflies at their best. Early June would have been preferable. The following species were recorded:

Middle and South-east Sardinia:

Swallowtail (*Papilio machaon*) – over the fourteen days a good number were looked at very closely and no *P. hospiton* were found, but two Swallowtails showed signs of hybrid *machaon* x *hospiton*. *P. hospiton* must be rare in the south-east of the island. No specimens of *P. alexanor* were seen.

Large white (*Pieris brassicae*) – was seen in small numbers.

Small white (*Artogeia rapae*) – small numbers.



- Bath white (*Pontia daplidice*) – small numbers.
- Corsican dappled white (*Euchloe insularis*) – one seen flying.
- Clouded yellow (*Colias croceus*) – reasonable numbers with about 20% - 25% of females being *helice*.
- Cleopatra (*Gonepteryx cleopatra*) – small numbers.
- Purple hairstreak (*Quercusia quercus*) – only seen in one area near Aritzo. Reasonable numbers seen feeding on sweet chestnut flowers, ten to twelve on one tree. Seven seen close up were all males.
- Small copper (*Lycaena phlaeas*) – small numbers of a smokey-grey colour.
- Long-tailed blue (*Lampides boeticus*) – small numbers seen in most places.
- Holly blue (*Celastrina argiolus*) – small numbers seen.
- Brown argus (*Aricia agestis*) – common.
- Common blue (*Polyommatus icarus*) – common.
- Nettle-tree butterfly (*Libythea celtis*) – seen only in the Aritzo area in small numbers.
- Two-tailed pasha (*Charaxes jasius*) – seen in four different areas. Four were seen around one wild pear tree.
- Southern white admiral (*Limenitus reducta*) – seen in six areas in small numbers.
- Large tortoiseshell (*Nymphalis polychloros*) – seen in one area only.
- Peacock (*Inachis io*) – small numbers in most areas.
- Red admiral (*Vanessa atalanta*) – seen in all areas.
- Painted lady (*Vanessa cardui*) – good numbers in most areas.
- Small tortoiseshell (*Aglais urticae ichnusa*) – we searched long and hard but no specimen was seen. Possibly too late or between broods.
- Comma (*Polygonum c-album*) – small numbers seen in several places.
- Cardinal (*Argynnis pandora*) – good numbers seen in Aritzo area. Reasonably common. Largest specimen 76mm wingspan.
- Silver-washed fritillary (*Argynnis paphia*) – reasonably common in most areas. At least eight *valesina* seen.
- Corsican fritillary (*Argynnis elisa*) – seen in three different areas; quite large numbers just outside Aritzo.
- Queen of Spain fritillary (*Issoria lathonia*) – widespread in small numbers.



Southern grayling (*Hipparchia aristaeus*) – seen in four places.

Corsican grayling (*Hipparchia neomiris*) – only one specimen seen.

Great banded grayling (*Kanetisa circe*) – widespread in small numbers.

Meadow brown (*Maniola jurtina*) – common and widespread. Var. *M. jurtina hispulla* also found.

Sardinian meadow brown (*Maniola nurag*) – widespread.

Gatekeeper (*Pyronia titbonus*) – common.

Southern gatekeeper (*Pyronia cecilia*) – not recorded in Tolman, but found common and widespread.

Small heath (*Coenonympha pamphilus*) – widespread in small numbers.

Corsican heath (*Coenonympha corinna*) – in good numbers in suitable areas.

Speckled wood (*Pararge aegeria*) – widespread in small numbers.

Wall brown (*Lasiommata megera*) – seen in most areas.

Obethür's skipper (*Pyrgus armoricanus*) – seen in small numbers.

Pigmy skipper (*Gegenes pumilio*) – seen in one area only.

Other insects seen:

Banded Agrion, Agrion vlingo, *Agrion haemorrhoidalis*, *Libellula fulva*, *Crocothornis erythraea*, *Sympetrum striolatum*, *Oedipoda germanica*, *Calliptamus italicus*, *Polysancus denticauda*, Great green bush cricket (*Tettigonia viridissima*), *Daeticus albifrons*, Praying mantis (*Mantis religiosa*), *Ameles decolor*, *Eurydema domenulus*, *Graphosoma italicum* (the red ground colour being replaced by yellow). Cicadas: two were caught and examined, *Cicada orni* and *Tibicina haematodes*, both quite common. Ant lions: *Dendroleion patherinus*, *Myrmelion formicanus*. Hummingbird hawkmoths seen in several areas. Robber fly (*Dasypogon diadema*). Velvet ants: *Myrmilla capitata* and *Dasyabris mauna*. *Xylocopa violacea* seen in small numbers in all areas. *Cerambyx cendo*, one seen flying near Aritzo one evening. *Mylabris polymorpha* in large numbers in all areas. *Hoplia argentea* and *Scolia flavifrons* seen in small numbers in several areas. These were the largest we have ever seen. One had a body length of 40mm. We had caught and examined *Scolia flavifrons* from Greece, Crete and Sicily in previous years.



Some notes on *Evergestis limbata* (L.) Pyralidae

by Alan Cronin (4701)

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and Don McNamara (5537)

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The first British mainland record of this moth is, I believe, the 11th September 1995, when a male came to the light (80 watt MBF/U lamp) which was working in my small conservatory at my Portslade address. It was not a particularly good mothing evening as the only other moth was a Small dusty wave, *Idea seriata* (Sdr.).

No more were seen until the 24th June 1997 when another male came to light at the same spot at 11.45pm. On the 28th June another one was found dead in a spider's web, also in the conservatory, in the early morning. A fourth male was recorded at 1.00am on the 29th June of that year.

On the afternoon of Sunday 29th June, three entomologists, Bernard Skinner, Colin Pratt and Mark Parsons of the NHM, came to see the "famous" site where *limbata* was appearing.

It was while we were taking tea around the garden table that the fifth *limbata* came out of a bush on the opposite side of the garden. Bernard was quick to catch it in a glass-bottomed pill box. It was another male.

The sixth moth came to the lamp at 10.48pm on the 7th July and two more males on the 13th at 11.25pm and 12.05am. A ninth came at 10.30pm on the 16th July and a tenth came to the lamp at 10.45pm on the 16th August.

During August the wild plants in my garden were searched for any larvae which looked as though they might belong to a micro just on the chance that they might produce a *limbata* moth. All my finds were placed in boxes with the food plants upon which they were found, and labelled.

At 9.30am on the 7th September the eleventh *limbata* emerged, having been bred from a single, full-grown, green larva which had been found on a small hedge mustard plant at the bottom of the back garden. It was photographed whilst expanding its wings. It lived for eight days.

It is interesting to note that this larva was green as all the subsequent larvae, bred or found, have been of a grey colour.



1998 was a good year for this species, all seen in my back garden, singletons in around the conservatory and obviously attracted to the light. The first was seen at 11.50pm on 19th June and the next, the thirteenth, arrived at 10.45pm on 24th June. Moths were then seen as follows: 11.10pm on 4th July, 9.50pm on 5th July, 11.20pm on 5th July, 1.00am on 6th July, 12.23pm on 9th July and another, the nineteenth *limbata*, at 11.03pm on 14th July. The moths caught on the 5th and 6th July (the 16th and 17th *limbata*) came to an Actinic lamp kindly lent to me by Bernard Skinner.

These moths were kept alive in order to try to get pairings and eggs. Initially they were placed in a large transparent box with some leaves of the larval foodplant, hedge mustard, and some flowers for nectar.

At the end of the first week of July each moth was placed in its own individual small plastic box with a leaf or two of hedge mustard and a few flowers. Two females had laid eggs, which were so small that they could not even be seen with a normal magnifying glass. The only hint that there were eggs was a suggestion of a glint that seemed to show where each egg might be. A local colleague of mine, Barrie Fordham, also a keen entomologist, came over and took photos – but unfortunately all that could be seen from the developed photos were sections of green leaf!

The first larva must have hatched out about the 19th July. At first they seem invisible, but, a few days later there were signs of very small larvae – signs of feeding appearing on the leaves. They grew quite quickly.

A single, half-inch long caterpillar was found in the garden on hedge mustard and taken indoors on 8th August.

On Sunday, 16th August (1998) Bernard Skinner visited me in the afternoon and whilst we were looking around in the garden he found four three-quarters grown larvae – and I gave him two of my smallest larvae for photographing. At that date most of my specimens were also approaching full growth. I had about 40 larvae at that time and I gave seven or eight larvae to Paul Sokoloff.

By early September most of the larvae had made small cocoons, but some just lay in the bottom of their plastic boxes and shrivelled and died, having turned a horrible brown colour. There are, however, two shrivelled, but healthy-looking larvae lying in the bottom of one of the boxes at the present (November 1998).

I would like to propose an English common name for this moth – as it now seems to be a regular visitor, the Black bordered gold (AC).



One *limbata* emerged on 31st August, dying on the 10th September. The other looks as if it will overwinter in its larval state.

Scanning the literature (DM) it is evident that this moth is spreading westwards and northwards – reaching for the present the edge of its range in the southern part of the UK.

The first UK record seems to be in Guernsey, La Chene Forest, 18th July 1990.

Two were captured at Chale Green, on the Isle of Wight on the 23rd and 30th of July 1994, two more on the same site on 14th and 21st July 1995. Also in 1995 one was recorded on Jersey on 28th July at Mont Orgueil.

Danish records show that the first appearance of this moth there was in 1967, where it was described to be common around Bornholm and along the east coast where it inhabits open woodland. It is said to fly freely usually in June and July, is easily disturbed and that there are probably two generations – the second being in the autumn.

It is also reported to be found in Sweden, Poland, the Czech Republic, Germany, Belgium, France and Spain. As yet there are no records from Finland.

Whilst British individuals seem so far to be associated with hedge mustard, it has been recorded on sweet rocket *Sisymbrium orientale*, woad *Isatis tinctoria* and Dyer's greenweed *Genista tinctoria*.

According to *Atropos*, No. 4 January 1998 (p41) further investigations of possible sites in Sussex and Hampshire were planned for 1998. Results are eagerly awaited.

Acknowledgement

I would like to thank Mark Parsons from the NHM for letting me look at the records (DM).

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PLATE 00A.

Macynia labiata – mating pair.

(Brock, Stick-insects (Phasmida) . . .)



Male



Female

PLATE 00B. *Macynia labiata* camouflage
(Brock, Stick-insects (Phasmida) . . .)



Female



Male

PLATE 00C. *Phalces longiscaphus*
(Brock, Stick-insects (Phasmida) . . .)



PLATE 00D.
Carausius morosus female
(Brock, Stick-insects (Phasmida) . . .)



PLATE 00E. Female *Ascalaphus corsicus*
(Dawson & Hemmings, Sardinia 1999)



PLATE 00F. A steep hillside with thick vegetation near Meana Sardo.
(Dawson & Hemmings, Sardinia 1999)



PLATE 00G. Carder bee *Anthidium manicatum* male showing posterior spines.
(Robinson, Bees in my Garden . . .)



PLATE 00H. Carder bee *Anthidium manicatum* female collecting wool.
(Robinson, Bees in my Garden . . .)



Some notes of ladybirds in north Cornwall

by Steve Robbins (8336)

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My wife and I began to take more than a passing interest in the ladybirds of our home area in north Cornwall when the North Cornwall Natural History Club was formed in 1993. The major function of the club was to note, record and publish the distribution of as much of the fauna and flora as possible within our area. Steve Christmas, at that time the ladybird recorder for the Caradon Field Club in south-east Cornwall, had greatly increased the knowledge of the ladybirds in that part of Cornwall, and we hoped to be able to do the same for north Cornwall – still a part of the country where much remains to be discovered about even the commoner Coccinellidae.

Our initial searching for existing records uncovered several sources of information, the major sources being the ERICA computerised biological recording system at the time based at the Camborne School of Mines. Adrian Spalding, the Director, kindly gave us access to the massive database of all the Cornish flora and fauna, which produced an initial baseline of nine species recorded to work from. Secondly, the Camborne Natural History Society survey of 1988 to 1989 which although inevitably biased towards the west of the county produced an additional set of data, this, together with our own records allowed us to build up at least a basic species list for the north Cornwall area in 1993. In addition there were the records held by the Cambridge Ladybird Survey (CLS) and the national BRC scheme.

The Camborne Natural History Society (CNHS) survey, although it massively increased the numbers of ladybird records, particularly in west Cornwall, also producing two new species for Cornwall, did not record any new species for north Cornwall.

The 11 species noted from the north Cornwall, local government area by 1989 were (these records coming from ERICA, CLS and the Camborne NHS survey):

2-spot ladybird (<i>Adalia 2-punctata</i>)	24-spot ladybird (<i>Subcoccinella 24-punctata</i>)
7-spot ladybird (<i>Coccinella 7-punctata</i>)	Cream-spot (<i>Calvia 14-guttata</i>)
10-spot ladybird (<i>Adalia 10-punctata</i>)	Orange ladybird (<i>Halyzia 16-guttata</i>)
14-spot ladybird (<i>Propylea 14-punctata</i>)	Pine ladybird (<i>Exochomus 4-pustulatus</i>)
18-spot ladybird (<i>Myrrha 18-guttata</i>)	Eyed ladybird (<i>Anatis ocellata</i>)
22-spot ladybird (<i>Psyllobora 22-punctata</i>)	



Of these 11 species, only the 7-spot had significant numbers of records, of the remainder many rested upon a single record.

The 11-spot (*Coccinella 11-punctata*) was added to the list in 1992 (record from ERICA), followed by the Larch ladybird (*Aphidecta oblitterata*) in 1994 (North Cornwall Natural History Club record). The Striped ladybird (*Myzia oblongoguttata*) was added in 1995, this being the first record for the county. 1996 saw the addition of the Cream-streaked ladybird (*Harmonia 4-punctata*), again, as far as we are aware a new Cornish record. The Kidney-spot ladybird (*Chilocorus renipustulatus*) and the Heather ladybird (*Chilocorus 2-pustulatus*) were also recorded for the first time in north Cornwall in 1996. This brought the species list for north Cornwall to 17 out of the 24 ladybird species occurring in Britain.

It is likely that some of the remaining seven species may well turn up. There are another four species that have been recorded elsewhere in Cornwall; the Water ladybird (*Anisosticta 19-punctata*), Adonis ladybird (*Adonia variegata*), 16-spot ladybird (*Micraspis 16-punctata*) and Heiroglyphic ladybird (*Coccinella heiroglyphica*). There is only a single record for this last species in a 10km square (SX16) partly in the Caradon district of Cornwall and partly in north Cornwall, unfortunately no further details of the record can be found. Any of these four species could well be found in north Cornwall.

Of the remaining three species, 13-spot (*Hippodamia 13-punctata*) is probably extinct, there having been no records since 1950. The 5-spot (*Coccinella 5-punctata*) is something of a mystery; it was thought to be extremely rare until it was found in a number of sites in Wales and Scotland living in unstable river gravels. There is a pre-1913 record from Devon and its rediscovery in this area cannot be ruled out. The Scarce 7-spot (*Coccinella magnifica*), thought to be associated with Wood ants' (*Formica rufa*) nests is local and scarce but its presence in Cornwall and in particular in north Cornwall should certainly not be discounted.

Provisional notes on the species distribution in north Cornwall

24-spot ladybird

Recorded from six 10km squares in north Cornwall. Frequenting grasslands and hedgerows. From the records available this species is probably of widespread occurrence in north Cornwall in suitable lowland, sheltered and well vegetated area. It is not the easiest of species to find, a sweepnet can be effective. Once found, identification of the russet coloured, hairy ladybird is straight forward.



Larch ladybird

First recorded in north Cornwall in 1995, when a specimen was noted at Roughtor on Bodmin Moor. Several were noted in 1997 from an isolated Douglas fir in a garden near Launceston. The paucity of records may reflect the difficulty in recognising this most “unladybird-like” species as a ladybird, and future records will very probably show the species to be widespread.

2-spot ladybird

The status of this species in north Cornwall has proved difficult to establish. Prior to the 1988 CRNHS survey there were eight, 10km square records in north Cornwall, most of these records came from the Cambridge Ladybird Survey. The ERICA database supplied a further five records from three 10km squares, all from the south and west of the area. One new record for north Cornwall was produced by the 1998/9 CNHS survey. Survey work since 1988 has produced only two further records, both from the same area around the northern side of the Camel estuary. There are now a total of nine 10km squares recorded, but only one of these has produced any post-1988 records. The conclusion has to be drawn that despite the relative abundance of this species in southern and eastern areas, this is a scarce insect in the area under consideration (although of course the situation may be different in years of strong migration). It is however, quite possible that it is under-recorded as this species is thought to have a predilection for urban and suburban areas – such areas are few and far between in north Cornwall and tend to be poorly recorded. (A record from the centre of Bude in 1998 would tend to support this supposition.)

10-spot ladybird

The distribution map shows a good spread of records for this highly variable species and it is likely that the species is present throughout north Cornwall. As well as the “normal” type, examples of all the three major forms have been noted (*decempunctata*, *decempustulata* and *bimaculata*). *Bimaculata* would appear to be the scarcest form in north Cornwall but more records are needed of the comparative numbers of the different forms.

7-spot ladybird

The commonest species by a very large margin in north Cornwall, occurring throughout the area and often abundant, it can be found in most habitat types.



11-spot ladybird

Curiously, I can find no records of this species prior to 1992. This almost certainly reflects lack of recording in the area, certainly it is one of the commoner species at the present time. A widespread species, found throughout the area, can occur in large numbers locally, often found overwintering on gorse. Not restricted to coastal areas as was once thought.

Cream-streaked ladybird

First recorded in Britain in 1937 in Suffolk, the species has spread rapidly, its westward progress reached north Devon in 1987 and south Devon in 1988. The first record for the species in Cornwall (and VC2) came in 1996, when it was found to be present in some numbers on the conifers (Corsican/Maritime and Scots pine and *Cupressus macrocarpa*) growing on the dune systems on the northern side of the Camel estuary. This remains the only recorded site for the species in Cornwall to date.

18-spot ladybird

Only a single site known for this species at present. A conifer specialist, it has been noted overwintering in Scots pine and Corsican pine where, despite its reputation for preferring the crowns of the trees, it has been found commonly on the lower branches.

Cream-spot ladybird

Appears to be sparsely but widely distributed in the area, specimens can be found on a wide variety of substrates - a generalist.

14-spot ladybird

From the record available at present, this is probably the second most common species of ladybird in north Cornwall, frequenting grassland habitats, but can also be found on deciduous trees. Almost certainly found throughout the area.

Striped ladybird

This large ladybird, a pine specialist, was recorded for the first time in Cornwall in 1995. Again, as with the Cream-streaked, it was found to be resident on conifers growing on a mature dune system on the northern side of the Camel estuary. Here it breeds and overwinters around the terminal buds of the lower branches of Corsican pine. There has been considerable doubt about the overwintering site for this species; it has



been suggested that it may pass the winter months underground. At its only known station in north Cornwall it spends the winter on coniferous trees (Scots and Corsican pine), certainly on the lower branches, though it may well be equally distributed over the whole tree. Specimens were found chiefly around the terminal buds.

Eyed ladybird

Only two records for this species in north Cornwall. No doubt under-recorded, but probably scarce none the less.

Orange ladybird

Thought at one time to be a very scarce species, an association with "ancient woodland" was even suggested, the Orange ladybird is quite common in north Cornwall and can occur in abundance. Associated with sycamore, though it can be found on many tree species and is also quite commonly attracted to m.v. light. Almost certainly of frequent occurrence throughout the area it can be found in large numbers on deciduous trees and shrub species in early spring – noted overwintering on ash twigs, usually in a sheltered position underneath the twig, sometimes several together.

Kidney-spot ladybird

One site only. The first record for north Cornwall was in 1996 when specimens were found overwintering on the lower branches of mature *Cupressus macrocarpa* on the rock dune system (northern Camel estuary). This species is generally thought to be associated with deciduous trees and this would seem to be an atypical wintering/breeding site. We have found no other reference to this species living on coniferous trees.

Heather ladybird

One site only. Found at the same location and at the same site as the Kidney-spot – see above, again, the first record for the area and on *Cupressus macrocarpa*. Again this would seem to be a typical site for the heather specialist.

Pine ladybird

Four 10km squares recorded only, all records came from a variety of conifers, including Douglas fir, Corsican pine, Scots pine, *Cupressus macrocarpa* etc. The species is almost certainly a lot more widespread than the records would, at present, suggest.



Table 1. Provisional table of species abundance. 1988-1998.

Ubiquitous and common	Widespread and locally common	Scattered distribution, not generally common	Scarce, more than one site	Scarce, one site only	Not recorded since 1988
7-spot	14-spot 10-spot 11-spot Orange	24-spot Cream-spot Pine	Eyed Larch 2-spot 18-spot	Striped Cream-streaked Heather Kidney-spot	22-spot

Table 2. Recorders, sites and dates for new species for Cornwall and north Cornwall.

Species	New for	Date	Location	Recorder
11-spot	North Cornwall	1992	Brenay SX0561	CN French
Striped	Cornwall, VC2	Dec. 1995	Rock SW9276	P Spong/CSR
Cream-streaked	Cornwall, VC2	2.6.96	Rock SW9276	CSR/LMR
Heather	North Cornwall	15.6.96	Rock SW9276	CSR/LMR
Kidney-spot	North Cornwall	9.3.96	Rock SW9276	CSR/LMR

Summary

- The current knowledge of ladybird species distribution in north Cornwall is noted, including many new records collected by members of the North Cornwall Natural History Club.
- Two new species (Striped and Cream-streaked ladybirds) for Cornwall and VC2 are noted.
- Some unusual wintering sites are put on record.

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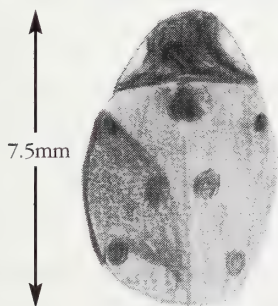
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Strangely pigmented ladybird

by Jacqueline Ruffle (5911)

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Whilst in the garden on a warm day in mid-September last year, my attention was drawn by a ladybird which, at a quick glance, appeared darker than usual. After capture, I could see that it was a seven-spot ladybird (*Coccinella 7-punctata* Linn.) but the left elytrum was two-thirds covered by a brown pigment which obscured the top side spot.



Having consulted Mike Majerus' book, *Ladybirds*, I find that the aberration falls within the definition of "non-heritable variation", and I quote: "... of particular note are bronzy-brown or black patches which occur occasionally on the elytra of red species. These patches are often irregular in shape, and asymmetrical between the two elytra. It is thought that these patches of abnormal pigmentation are the result of disruption of pigment production, resulting from injuries to larvae or pupae. Often these injury marks are edged with a line of black. It is probable that this is adaptive, for the black will be produced by the deposition of melanin pigments in the cuticle. Melanin is granular in form, and has a strengthening effect."

Reference

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Bees in my garden: 1999 – the year of the Wool-carder bee

by Neil A. Robinson (10002)

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The "Wool-carder bee" *Anthidium manicatum* (L.) is a solitary bee which shares its shortened name of "carder bee" with the bumble bee *Bombus pascuorum* (Scop.). It is a member of the family Megachilidae (Leaf-cutter and Mason bees), about the size of a medium bumble bee, but has a shiny black abdomen with a row of small bright yellow spots on each side. The female's pollen-carrying brush is on the underside of the abdomen. The male has five projecting spines at the end of his abdomen which he uses instead of a sting (which males do not possess). This bee is well known for two features: the female's habit of collecting woolly tomentum from plants to line the cavity in which she constructs her cells, and the male for establishing a territory over a clump of flowers from which he drives other bees away, keeping it for his own female(s). This the only bee in Britain where the male defends a territory. It was thought to be scarce in northern England – the distribution map in the *Provisional Atlas of Aculeate Hymenoptera Part 1* (Edwards, 1997) shows no recent records at all for the north of England, though there are some for Dumfries and Galloway. Therefore I was pleased when in 1996 I found it in Cumbria near Grange-over-Sands (SD4276), and since then I, and several other people, have found it at various places in Lancashire and Cumbria which suggests that it is quite widespread, though no doubt local. It is perhaps more easily seen in gardens than in the countryside because of the males' habit of hovering persistently around a particular clump of flowers, alternating with settling in a conspicuous place.

Females use existing cavities as nest sites, e.g. hollow stems, insect holes in wood, crevices in mortar etc. The cell walls and closing plug are made from compacted layers of long, silky hairs which the female shaves off leaves with her mandibles and then works into a kind of felt, hence the name of "carder bee". A range of hairy wild and garden plants are known to be used, but in this part of the country their favourite garden plant seems to be lamb's ears, *Stachys lanata*. In 1997 I saw a male patrolling a patch of this plant in the local garden centre nursery, but evidently a female did not arrive, and the male disappeared. In 1998 I found a male patrolling purple toadflax, *Linaria purpurea* in my garden. Again no female appeared, so to provide



encouragement I planted a small pot of lamb's ear in a sunny place in the front garden. By early July 1999 it had grown into a large clump, with immediate results – a male carder bee was regularly patrolling and nectaring. By the 19th July two females, one noticeably larger than the other, were regularly foraging at the flowers, while the male was usually in attendance, dividing his time between hovering around the clump, nectaring, sunning on a regular perch, chasing off bumble bees and pouncing on a female to mate. The frequency of mating surprised me. It often occurred several times during a couple of hours of observation, and continued right through the flight period, being last seen on 21st August. The female generally acquiesced, but perhaps had little choice in the matter as the male is the larger of the two – another unusual feature of this species. The smaller female was picked up moribund on 10th August. The other female was last seen on 21st August, and the male on 28th August, by which time his left mid-tibia was missing.

The bumble bees visiting the lamb's ear were mainly *Bombus terrestris* (L.), sometimes workers, but more often males, and occasionally *B. pascuorum* workers, quickly evicted by a swift pounce and simultaneous prod from the carder's posterior spines (Plate 00G). On one occasion I was impressed to see it tackle a huge *B. terrestris* queen, which fell to the ground and flew slowly away. None of the bumbles seemed to be injured by these encounters, unlike honey bees which have sometimes been described as being crushed and disabled. It was interesting to note that although males of *B. lucorum* (L.) and workers of *B. lapidarius* (L.) and honey bees *Apis mellifera* L. were numerous on a nearby prairie mallow *Siddalcia*, they never visited the lamb's ear, even when the carder male was not present. This suggested that the flowers did not attract them, rather than they were kept away, although in September, when there were still a few flowers left on the lamb's-ear but the carders were no longer present. Honey bees and *B. pascuorum* did occasionally visit. Only small hoverflies frequented the lamb's ear. They had no difficulty in side-stepping the male's charge and then followed him around until they were chased away. On one occasion in July another male carder arrived, resulting in a furious buzzing confrontation in which the two hovered face to face, drifting slowly around, until they collided with me and the intruder made off.

The females, when foraging, moved very rapidly from flower to flower, as did the bumbles when they got the chance, suggesting that they only obtained tiny amounts of nectar from each flower. However the lamb's ear was evidently able to go on producing nectar throughout



the day, because on sunny days the carder females were already foraging at 8 a.m. and continued all day until the sun went off the clump at 8 p.m. They also showed a remarkable ability to continue foraging in cool, cloudy weather, even with spots of rain – conditions under which no other solitary bee I knew of would be flying. The male was much more temperature dependent – under cool conditions he would be found torpid on his perch, but then climbing up the inflorescence and stoking up with nectar, to resume patrolling when the temperature rose. While nectaring, the females were also collecting the greyish-white pollen on their legs and periodically stopping to transfer it to the pollen brush under their abdomen. The male also acquired pollen, which he shed every now and then by rubbing together the mid and hind legs while hovering, or occasionally from the top of an inflorescence while using the front legs to hold the body clear. Long periods of foraging by the females were followed by about an hour of wool-gathering. This took place not from the upright shoots, but from the undersides of the leaves in the basal rosette, which necessitated me kneeling down in the rockery to observe and photograph what was going on. The female started head up on the underside of the leaf, shaving off the woolly tomentum with her jaws (which sometimes produced a distinct rasping noise) and pushing the material back underneath. Then, holding on only by her hind feet, she quickly rolled this mass between her front and mid legs and jaws into a perfectly spherically ball as big as herself, before dropping off the leaf and lifting slowly out of the rosette (Plate 00H). The whole process took less than a minute. She then flew off, gradually gaining height, across the road over the bungalow opposite, in the general direction of the garden centre nursery.

I did not find out where they were nesting, but watching the performance of the male, which he kept up, on and off, for eight weeks, and the skill of the females in manipulating their balls of wool, was fascinating. You may already have it in your garden, but if not – try planting some lamb's ears!

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Evolution – The modern obsession

Part I. Moths, Tits and DDT

by Nick Brown (9289)

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As we near the end of this century there seems to be a growing compulsion to explain all form, function and behaviour in living things purely in terms of competitive evolution. By way of an example, it is impossible to listen to a David Attenborough narrative without the words “evolved” or “adapted” entering into the script every few minutes. This attitude prevails in the scientific community, in the media, the education system, and indeed in the pages of this very journal. It is quite noticeable, particularly in the more scientifically presented contributions to this *Bulletin*, that there is a desperate attempt to explain every last detail of an insect's life history by way of the presumed “survival advantage” and thereby supplying an explanation as to how a certain behaviour or characteristic came into being.

We continually and conveniently forget the nature of the Theory of Evolution, namely that it is a “theory”. It is not a proven fact beyond all possible doubt that every feature of life on earth arose in this manner. Scientific conclusions in the field of evolution are generally based on chains of assumptions and speculations. This is a thinking process which is, paradoxically, not very scientific.

Some contemporary claims to evolution are quite absurd, the case of the Australian fungus beetle for instance (*AA book of the countryside* (1973)). Introduced from Australia in the 19th century the beetle found an empty niche in a British bracket fungus. But this is merely an example of a species making use of a new resource, it has nothing to do with genetic change. No doubt some will say that the expansion of the Orange tip butterfly northwards is “evolution” when perhaps the more obvious reasoning is that it is the climate and not the butterfly which is changing.

Contrary to popular belief it is possible to be an intelligent person holding an honours degree in biological sciences and at the same time to be not utterly convinced by the musings of Father Darwin. I am such a person, and the purpose of my own musing here is to help other non-believers come out of the chrysalis. Or perhaps some of the younger readers have never questioned the established thinking.



Let us begin with a simple example that appeared in a recent publication (*Butterfly Conservation Dorset Branch News, Winter 1998*). A report on moth predation is given in which Dr Susan Clark relates a study where it was found that the diet of tit nestlings was largely made up (86%) by November and Winter moth larvae. Then follows the conclusion, and I quote, "The moth produces huge numbers of offspring to ensure enough survive this predation." Compare this statement with my own rather opposite conclusion which is, "The moth produces huge numbers of offspring to ensure enough tits survive."

So which of these two statements is the more factual? To say that the moth produces huge numbers of offspring to ensure its survival is typical Darwinian thinking, always relating all biological strategies to the survival of the selfish species. But is it not possible to demonstrate, within the complexities of natural ecology, that a high reproduction rate is the key factor in the survival of November and Winter moth species. It is not as simple as that. We do not know what would happen to the moths if they suddenly started producing less offspring. True there would be fewer potential survivors, but also there would follow less predation since the dependent tit population would undoubtedly start to fall. And numerous other factors might come into play. What we do know for sure is that the moths make up 86% of the tit nestlings' diet at a time of year when other food sources are scarce, therefore it is a clear fact that the moths are largely responsible for the survival of the early season tit generation.

What I am saying here is that there is factual evidence to demonstrate that the high reproduction rate in the moths is of great benefit to the survival of the tits, but there is no factual evidence to show that the high reproduction rate benefits the survival of the two moth species.

Evolutionists would say that the November and Winter moth genes are programmed to produce huge numbers of offspring to ensure the survival of the species. I am saying that the November and Winter moth genes are programmed to produce huge numbers of offspring to ensure the survival of another species!

While I leave the reader to ruminate on this startling conclusion remember that before the advent of Darwin last century and of the Selfish Gene in this, writers often portrayed nature as being bountiful, as the provider. So perhaps this is not such a novel perception after all.

My second representation to challenge modern evolutionary zeal comes by way of a Radio 2 feature broadcast last year. A listener had written in asking if it were true that insects were set to take over the



world. This was in reference to the high degree of resilience and adaptability observed in some insect groups enabling them to survive extreme conditions including chemical attack. The suggestion was that should the planet earth suffer some kind of environmental catastrophe then insects would have a better chance of living through than humans would. An entomological expert (whose name I am afraid escapes me) had been invited to respond on air to the question, concentrating in particular on the subject of insect pest resistance. In his opening statement the guest expert enthusiastically proclaimed that we were "actually witnessing evolution in action". This is an imaginative and dramatic conclusion but one which is substantially lacking in factual evidence.

Before we can discuss whether or not evolution could be said to have taken place we need to define what we mean by the concept. The two words "evolution" and "adaptation" are used interchangeably and synonymously to mean anything from a species exploiting a new resource (which requires absolutely no genetic change) right through to the perceived origin of a whole distinct group of organisms. Vague notions give rise to vague theories – to my mind when we are talking about evolution we mean the changing of one species into another, or at the very least the origin of uniquely new genetic material. Adaption differs from evolution in that it does not necessarily require the spontaneous appearance of new mutant genes, it may occur as a simple learned behavioural change or through the selection of varied gene types that already occur in the species gene pool.

Now that we have a clearer idea of the difference in meaning between evolution and adaptation which of these two principles best describes the appearance of resistant individuals in insect pest control? To answer that we need to examine the various possible ways in which resistance comes about, and I can think of three ways.

1. Certain individuals in the pest species already possess the physiological ability to deal with the chemical poison, before it is first used. Then, when the new chemical comes into use, it acts as a selective agent for these few individuals and exterminates the rest.
2. At some point in time after the new chemical insecticide is first used, one or more individuals in the pest population spontaneously and purely by random chance arise with a genetic mutation which happens to be the right one to give them the physiological capability to cope with the chemical poison. These mutant individuals are then selected out for survival.



3. The use of the insecticide actually causes a mutation in the pest which happens to increase its resistance to attack.

Possibility number one is the easiest to demonstrate. If a lethal dose test is performed at various levels then the usual result is the observation that some individuals survive while others do not. Survival will be affected by age and general state of health and also by different inherent degrees of tolerance between individuals. The important point here is that the survivors are being selected by virtue of their existing genetic make-up. This is an adaptive process whereby the pest population manages to survive by drawing on genetic reserves that are already present in the species gene pool.

Possibility number two is hard to demonstrate. If an individual member of the pest species turns up with a raised genetic tolerance to an insecticide, how on earth do we know whether the genes responsible for that tolerance arose out of mutation one generation ago, or whether they have been in the species gene pool for a million years?

Possibility number three is a interesting one, the idea that the use of a chemical actually causes a genetic change directly. I have never heard of any work which has demonstrated this effect but I would certainly be interested to know if any such exists.

Possibility number one fits the definition of adaptation, *i.e.* existing genetical material. Possibilities two and three fit the definition of evolution *i.e.* new genetic material. Whereas possibility number one, the adaptive process, is easy to demonstrate, possibilities two and three, the evolutionary processes, have not or cannot be demonstrated.

We are now in a position to answer the original question, "Is insect pest resistance an example of evolution in action?" And the answer is, "No, not that we can show, but it is an example of adaptation."

It is simple to demonstrate that some individuals of an insect species already possess an inherent level of resistance but it is not possible to demonstrate that individual tolerance arises out of a recent chance mutation. This argument does not prove that evolution never happens in insect pests, but it shows that adaptation is factual where evolution remains theoretical.

It may be argued further that insect pest resistance is not even an illustration of natural selection since there is nothing natural about DDT and its derivatives. But I shall elaborate more on the distinction between "natural" and "artificial" selection in the second part of this discussion.



One final comment: the principle that evolution is the consequence of a long series of adaptations is fallible. This is because adaptation does not necessarily require the origin of uniquely new genetic material whereas evolution by definition does.

In part two of "Evolution – The Modern Obsession" I shall be looking at that classic evolutionary chestnut, the case of the Peppered moth.

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Butterfly Conservation Dorset Branch News, winter 1998/99 p.34.

Mediterranean brocade in Cheltenham

by *Graham Stevens (10417)*

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On the 6th July 1999, my wife and I returned to our home in Cheltenham for our normal summer holidays. I mentioned the date, as I believe it to be important. On the 26th August my wife pointed out to me a fully-grown larvae of the Mediterranean brocade (*Spodoptera littoralis*), which I recognised instantly, walking across our living room. I placed the caterpillar in a container and fed it on dandelion, but within a few days it had formed a pupa. When it emerged I was able to confirm that it was the Mediterranean brocade, although much darker than normal.

It is possible that we carried the larvae over to the UK in our car, but what had it fed on? We had not brought over any plants or fresh fruit/vegetables, nor had we bought any plants since our arrival in the UK. I don't know the time it takes this species to reach the stage from egg to maturity, maybe someone reading this article will be able to help?

I carried out a search of the house and gardens but did not locate any others.

An unusual occurrence?

by *Anthony Crawforth (9510)*

42 Bulstrode Court, Gerrards Cross, Buckinghamshire SL9 7RT.

Date: 6th October 1999. Time: 12.25. Weather: fine, sunny and warm. Location: Gerrards Cross common. Species: Purple hairstreak (*Quercusia quercus* (L.)).

I am unaware of this species having a second generation and, having watched it in this location for a number of years, was astonished to see one flying around oak in the morning.



Maggot Mystery

by Kieren Pitts (10563)

39 Adkin Way, Wantage, Oxon, OX12 9HN.

In answer to the questions posed in the *Bulletin* in December 1999 (p207) by Ian McClenaghan, I'm in the final year of a PhD at the University of Bristol working on *Lucilia sericata*, the Sheep blowfly. During the course of this work I have bred literally millions of blowflies and can vouch for their Houdini-esque exploits first hand. Blowfly maggots go through three feeding stages before entering a period of dispersal known as the wandering phase. It is at this stage that most are sold from fishing tackle shops. During the wandering phase they do not feed, empty their gut and are extremely mobile. Usually they then pupate. Unfortunately sometimes they decide to become escape artists instead. The cue for this behavioural change is almost certainly related to over-crowding; similarly they will wander prematurely if over-crowded whilst feeding. It makes good sense for the maggots to disperse away from each other before pupating to avoid attracting predators or parasitoids. However, in captivity it is largely over-crowding of the maggots that allows them to scale slippery surfaces. Non-feeding mature maggots packed together respire and also excrete some waste leading to them becoming rather damp. They can then use this moisture to adhere (due to surface tension of the water and from the fact that between the maggot and the surface there is only moisture, they therefore act as a living "sucker") to slippery surfaces and can then climb them with ease. In fact 18cm is relatively low in terms of maggot mountaineering; I've seen them climb well over 50cm on vertical slippery plastic and almost a metre on metal. Once the maggots have taken it upon themselves to migrate there is little to stop them. You can collect them up but they'll still try to escape again. When we breed our maggots at Bristol we tend to have them wander into sawdust which we sieve when the maggots have formed puparia. The sawdust keeps the maggots dry and also means that they can move through it and are less crowded. Also the sawdust helps when the flies are emerging from the puparia. In addition to this maggots seem less prone to wander if they are kept in a well lit place, they are more likely to try and escape overnight and are less likely to try if you keep the light on in the room they are in.

In fact climbing is only one of the impressive feats that these escape artists are capable of, they can also go through the tiny holes in the plastic lids of bait boxes and also round a knot made in a polythene



bag! Once free they move rapidly and end up all over the place (even inside plugs of electrical equipment), in my experience these releases and the resulting flies make you unpopular and are best avoided if at all possible.

I hope this goes some way to answering your query, although by the time you read this I suspect that your garage will have been swarming with mature bluebottles. Just another fascinating fact from the world of blowflies!

Worcestershire ants

by Geoff Trevis (7049)

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Whilst standing under an oak tree at a nature reserve which I manage, I was mainly engaged in watching a cuckoo above me, this being the first of the year that I had seen. After calling for a few minutes the bird flew away and I transferred my attention to the bark of the tree and noted a few small, brown ants running up and down. They were small, agile and kept to the deeper fissures and it required a good suck on the pooter to enable capture. Keying them out later I was delighted to discover they were *Lasius brunneus* (Latreille) which has been previously recorded in only a few sites in the county, these being Grimley Brick Pits nature reserve (Meiklejohn, *pers comm.*) and at the National Trust properties of Hanbury Hall and Croome Park (Alexander & Taylor, 1998).

The *RES Handbook for the Identification of the Formicidae* describes them as "A fugitive-tree-dwelling species, but also occasionally found in hedgerows. It has an inland distribution in South England . . .". This accords with my experience, the tree on which I found them being relatively isolated in a derelict hedge. The members of the Worcestershire BRC Invertebrate Group feel that this species is probably widespread with the current distribution being in line with the old adage that it maps the recorders and not the species. I would be very pleased to hear of any other county records or to receive any specimens of this or any other species of ant to help with our distribution mapping.

So far the reserve had yielded few ants or other Hymenoptera but I expect to add steadily to the list in the coming seasons. So far I have recorded *Lasius brunneus* (Latreille), *L. flavus* (Fabricius), *L. niger* (L.), *Myrmica ruginodis* (Nylander) and *M. rubra* (L.) among the



Formicidae; the common species of bumble bee, *Bombus pascuorum* (Scopoli), *B. terrestris* (L.), *B. lucorum* (L.), *B. lapidarius* (L.), *B. hortorum* (L.) and *B. pratorum* (L.); from the Vespidae, *Vespula vulgaris* (L.) and *V. germanica* (Fabricius) and from other bees species *Andrena fulva* (Muller in Allioni), some unidentified *Andrena* (Fabricius) species, some unidentified species of *Nomada* (Scopoli) and some sawflies all appearing to be Tenthredinidae and awaiting identification to species level.

Both the *Myrmica* species provided some interesting observations. The reserve contains a wide variety of habitats in an urban fringe environment amongst which is a small area of derelict heath with gorse and grassland. I had noted the mounds of ant nests here for several years and, assuming they would be *Lasius flavus*, I had not got round to investigating them. I was surprised to find the occupants of the first mound I studied were *Myrmica ruginodis* and the same was found to be the case in all the nests from which I collected. *Lasius flavus* itself was found in a single nest in a relatively wooded part of the site where the trees had been planted for amenity value by the local council! On another occasion whilst walking the reserve on a hot afternoon I noted that most of the flowers of hogweed (*Heracleum sphondylium* L.) were covered in ants. These all turned out to be *M. rubra*. The plants over a wide area were affected though other umbellifers such as cow parsley (*Anthriscus sylvestris* L.) and hemlock (*Conium maculatum* L.) were obviously avoided as not a single ant was found on them.

As a final note on the *L. brunneus* story and a reminder to other budding entomologists, may I remind them to check their pooter with care before use. Having spotted the ants, I extracted my pooter from my bag of collecting kit and proceeded to Hoover up a few specimens with some vigour. I was at first somewhat surprised at the lack of specimens in the tube. However, I soon realised that I had failed to note that the fine gauze on the "suck" side of the pooter had come adrift and I had therefore become not only one of the few to have found the ant in the county but probably the only one to have eaten them as well!

I will be continuing my study of the Hymenoptera at this site and would be pleased to hear from any hymenopterists among the membership who might be able to help and to assist this novice in the field to improve his identification skills.

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Chequered Skipper at 2100m

by Eddie John (7937)

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A certain phrase ... "It's not normally like this"... often haunts us on holiday. But in Switzerland it can, and does, happen. And last year it did! Rain, that is! Day after day of dismal weather, during which we found ourselves searching flower heads for sheltering, sodden Lepidoptera in the hope that the Bernese Oberland would yield something a little different from the sunny Valais region, which had been our favoured holiday choice for many years.

Then, on 17th July 1999, from a cloudless sky, the sun shone upon Kleine Scheidegg (2061m). After nearly two weeks of indifferent weather, hordes of tourists thronged the Railway Station and nearby restaurants, while others sunned themselves on the surrounding slopes. Seemingly, people were everywhere.

Yet, within a 15-minute walk, my wife and I had escaped the multitudes and had settled ourselves on a sparsely flowered, grassy, south-facing shoulder at a height of approximately 2100m. Views were spectacular and the silence almost complete except for an occasional marmot cry and explosive, crackling roars as minor avalanches tumbled from the peaks opposite.

Often at such altitudes butterfly numbers are not great and of 22 species seen in the immediate area, the Marsh Fritillary (*Euphydryas aurinia debilis* (presumably var. *glaciegenita*)) was most commonly encountered. Many showed considerable variation in size and colour as they flew in company with Shepherd's Fritillary (*Boloria pales*) and Pearl-bordered Fritillary (*Clossiana euphrosyne*). Mountain Clouded Yellow (*Colias phicomone*), common – even abundant – in the Valais, were scarce here, as were Moorland Clouded Yellow (*Colias palaeno*). Cranberry Blue (*Vacciniina optilete*) and Alpine Argus/Blue (*Albulina orbitulus*) were among six species of "blue" present. Dewy Ringlets (*Erebia pandrose*) laboured by in the sunshine.

But, just as I had convinced myself that I could distinguish between the Alpine Grizzled Skipper (*Pyrgus andromedae*) and the Dusky Grizzled Skipper (*Pyrgus cacaliae*), so bringing the species count to 21 for the area, number 22 was about to make an unexpected appearance. Returning to the spot where my wife had been passing the time reading, absorbing the scenery or keeping an eye open for any



butterflies that might intrude upon her space, I was handed a small, plastic box with the enquiry, "What's this then?". The impish grin (also worn when she found our first Plain Tiger (*Danaus chrysippus*) in Cyprus, a year earlier) promised something unusual. An altitude of around 2100m, remember, and no woodland clearings in sight. Indeed, the area was *well* above the tree line. In the box? A Chequered Skipper (*Carterocephalus palaemon*), caught within a few feet of her perch!

Tolman, (*Butterflies of Britain & Europe*, Collins Field Guide) suggests an altitude range between 200-1600m (in) "Grassy, woodland clearings: often in damp places...". Other writers concur.

Has anyone else encountered this species in such atypical habitat?

Larvae and moths in Glasgow

by Frank McCann (6291)

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In August 1998 I collected a half-grown Grey dagger larva from a small beech tree at Auchinlea Park, Easterhouse. It pupated after a while and in June 1999 a parasitic fly emerged from its cocoon. The fly was dark with hairs on its body and legs and was about the size of the common housefly.

Last summer, I put plants from my front verandah into the bath to keep them moist whilst I was on holiday. Upon my return I found a green larva near one of the flower pots. This pupated and turned out to be the Cabbage moth which emerged in May 1999.

A moth I collected, which flew into my lighted living room in June 1999, was brownish with lighter yellowish blotches and other marks on its forewings. I sent it to John Gregory and he identified it as most probably the Map-winged swift.

The area where I stay is good for Ghost swift moths during June and July. Lots of wild grasses and plants are common in the area, and the Ghost swift females fly over the grasses and drop their eggs down onto the ground. The larvae feed on the roots of the grasses and are like longish white grubs.

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- A review of the British Opomyzidae (Diptera) by C.M. Drake, 18pp, many figs, £2.00 + 30p postage. *Br. J. Ent. Nat. Hist.* 1993; 6: 159-176.
- Invertebrates in the landscape: invertebrate recording in site evaluation and countryside monitoring, £6 + 50p postage. *Br. J. Ent. Nat. Hist.* 1994; 7: Supp. 1 pp. 1-60. Seven papers presented at the National Federation for Biological Recording Annual Conference on 5 July 1991.

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The Amateur Entomologists' Society



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2000 AGM & Members' Day

Saturday 15th April 2000

The Palaeontology Demonstration Room
The Natural History Museum, London

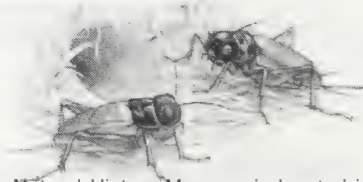
PROGRAMME OF EVENTS (*Bug Club events in italics*)

- 
- 10.30 Doors open for coffee
 - 11.00 Welcoming Address
 - 11.05 Talk 1 – Title and Speaker to be confirmed
 - 12.05 Annual General Meeting
 - 12.30 Lunch
 - 13.45 Talk 2 – Title and Speaker to be confirmed
 - 14.45 Tea
 - 15.00 Talk 3 – Title and Speaker to be confirmed
- 

Other activities will be arranged during the day. We also intend to host a full Bug Club programme for our younger members.

For further details please check the AES Website nearer the event at
<http://www.theaes.org>

On arriving at the museum, please report to the Life Galleries Reception area (to the right of the entrance kiosks), where you will be asked to sign in. The Museum staff will then direct you to the venue, which is situated at the far end of Gallery 30. The Museum opens at 10am. Members are encouraged to bring along exhibits to the meeting and bring along any specimens for help with identifications. AES Publications will also be in attendance.

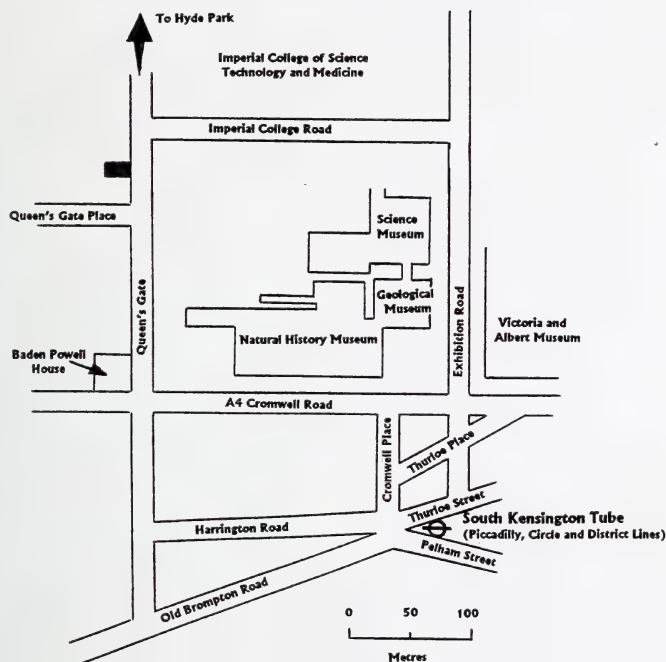


The Natural History Museum is located in South Kensington, London. There is limited parking available around the area and it is strongly advised that public transport is used. South Kensington tube station is located 5 minutes from the Museum and is served by Circle, District and Piccadilly line trains. Further information can be obtained from London Travel Information on 020 7222 1234.

AMATEUR ENTOMOLOGISTS' SOCIETY

AGM AND MEMBERS' DAY 2000

HOW TO GET THERE



**Natural History Museum,
Cromwell Road, London**

Saturday 15th April 2000

By Tube:

The Circle, District and Piccadilly Lines serve South Kensington Station which is a four minute walk from the Museum.

The meeting will commence at 11am in the Palaeontology Demonstration Room, at the far end of Gallery 30. Maps of the Museum will be available upon entry.

ENTRY TO MUSEUM

The Museum opens at 10am. Entry is free. To gain entry to the meeting, visitors should enter the Life Galleries Entrance on Cromwell Road, and report to reception where you will be booked in.

The Bulletin

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February 2000

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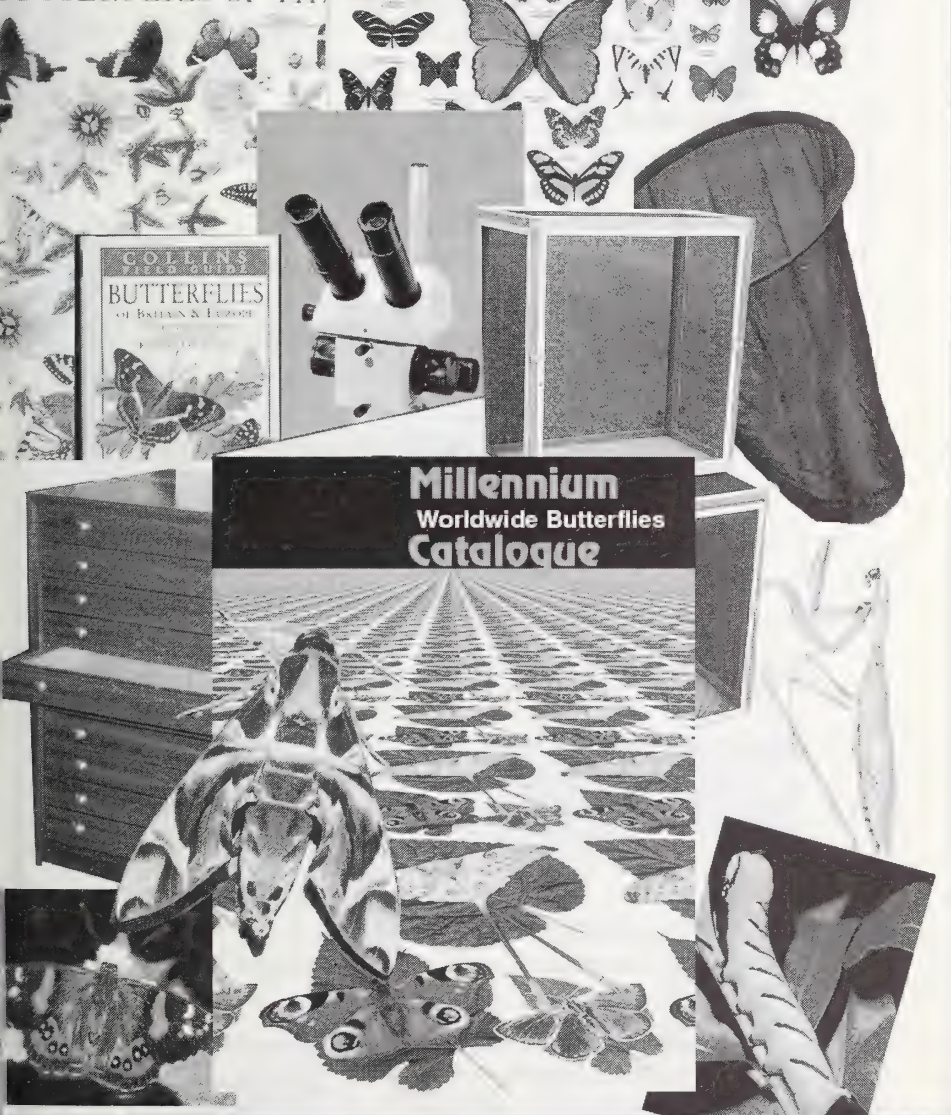
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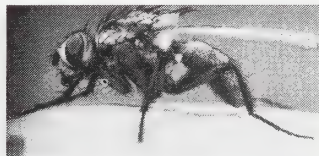
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This beetle can be a serious pest of ornamental lilies of the genus *Lilium*, as well as other related species such as the Snake's head Fritillary (*Fritillaria meleagris*) and the Lily-of-the-Valley (*Convallaria majalis*). It is widespread on the continent, but until recently very local in England, being mainly centred around Chobham in Surrey. However, it's range is now expanding quite rapidly.

Photo: Nick Holford.

The Bulletin

of the Amateur Entomologists' Society

Volume 59 • Number 429

April 2000

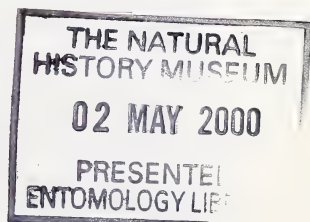
Editorial

With this issue of the *Bulletin* you will have noticed that we have included an additional publication in their envelope. The Butterflies of Cyprus, written by Eddie John and sponsored by Intervet, has been issued free to all current members of the Society after a long *Bulletin* article was adapted into a publication. The pamphlet will shortly be available for purchase from AES publications in the usual way.

The Annual Exhibition at Kempton Park is once again beginning to loom around the corner and bookings for table space are now being reserved. This as always is done on a first come first served basis and we are hoping to increase the number of stalls still further this year. If you are interested in booking space please contact us in the usual way.

Finally a plea on behalf of the Council. The number of people on Council has been slowly declining over the past five years and we are anxious that the spaces on Council are filled. We have had a number of new members join Council in recent times but we would like a few more! The duties are not terribly onerous and we meet around four times a year in Central London. If you would like to know a little bit more about what being on Council is about please contact me and I will be happy to fill you in on the details!

Wayne





The Cribb Award

Announcement

The Amateur Entomologists' Society is pleased to announce the establishment of a new award for achievements in any aspect of invertebrate conservation. Known as the Cribb Award, it will commemorate the life and work of the late Peter Cribb, who gave outstanding service to amateur entomology in many aspects, especially conservation. The award is open to all individuals permanently resident in the United Kingdom, except for current members of AES Council and of the panel of experts who will periodically confer the award. Although both amateurs and professionals shall be eligible, considerable weight will be attached to efforts which have been made beyond the call of any official duty. The award shall take the form of books and/or equipment of the successful candidate's choice up to a maximum value set by the AES Council. The adjudicating panel will confer the award on one person annually, subject to the nomination of one or more suitable candidates.

The Cribb Award: Rules and Procedures

The award is open to all individuals permanently resident in the United Kingdom, except for current members of the AES Council and the panel of experts who will periodically confer the award. Each candidate must be nominated by two persons other than members of his or her immediate family, and the nomination must be accompanied by five copies of an account of achievements for which the candidate is to be assessed. The account must be typed and must not exceed 500 words in length. The nomination should be sent to The Cribb Award, AES, PO Box 8774, London SW7 5ZG to arrive by 30th September of any given year. Nominations will be considered by a panel of four persons, one of whom shall be a member of Council of the Amateur Entomologists' Society (AES), while the remaining three shall be persons of suitable knowledge and experience to be appointed by Council.

The panel will sit annually and will on each occasion select one person for the award, provided that at least one nominee is deemed to have made a sufficient contribution to invertebrate conservation beyond the call of duty as an employed or self-employed professional. The name of the successful candidate shall be placed before the AES Council for approval immediately prior to the Society's Annual General Meeting, at which the award will be made. The value of each award shall not be more than the amount to be determined periodically by the AES Council.

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Evolution – The modern obsession

Part 2: The case of the Peppered moth re-examined

by Nick Brown (9289)

31 High Street, Stalbridge, Dorset. DT10 2LL.

When I was at school in the early 1970s studying for “O” level biology we were introduced to the topic of evolution and the case of the Peppered moth (*Biston betularia*) was alluded to as “the perfect living example of evolution in action”. Briefly put, a melanic (black) form of the moth was first observed in 1848 and this aberration, f. *carbonaria*, was seen to spread throughout industrial areas of Britain over the following decades. The obvious conclusion was that the new aberration was better protected against predation in areas where soot was deposited in walls and trees, and in fact this hypothesis was backed up by experimental data (Berry 1977). It was subsequently shown that the distribution of *carbonaria* was more closely linked to sulphur dioxide pollution and, more importantly, the disappearance of lichens. So it was not just that the melanic form gained a cryptic advantage, the typical form had lost its cryptic advantage due to the disappearance of its natural background.

Later research on into the mid-1970s indicated that this simple camouflage/predation model did not explain the whole pattern of distribution between the two forms and indeed a third intermediate form (Berry 1977). Nevertheless there is no denying that some kind of “genetic swing” had been witnessed, regardless of the explanation, but was it truly an example of evolution in action?

Once again we must seek to define what we mean by evolution in this context, for the term may be broadly applied to anything that progresses with time. The fundamental key to Darwin’s Theory of Evolution is the postulation that species are not immutable, the assumption that each species originates from another. This is the real essence of the theory, evolution is nothing less than the transmutation of one species into another. Clearly we have not witnessed the origin of a new species or anything like it in the case of the Peppered moth, so we cannot claim evolution on those grounds! But to be fair, let’s take a slightly more genetically enlightened conception. We could define evolution as the appearance of uniquely new genetic material in a species gene pool that previously did not exist there. Can we now apply this more modern interpretation to the case of the Peppered moth?



No we can't, because we cannot prove that the melanic form never existed before 1848. Just because *carbonaria* had not been officially documented before 1848 that is no proof of its lack of existence before that date. It should be noted that whole species of moth were still being discovered and named in Britain around that time let alone variations (Stainton 1855). And besides, melanism is a common aberration in many species of moth and indeed other insects. More likely than not the melanic trait occurred in the Peppered moth before the industrial revolution, albeit rarely manifested.

So it is doubtful that the case of the Peppered moth qualifies as evolution as defined by the appearance of new genetic material. It might none the less illustrate some of the basic principles connected with the theory. For instance one aspect of our understanding of the concept of evolution is that there is a general move towards ever more complex and advanced forms. But it is hard to see how f. *carbonaria* could be described as being any more complex or advanced than the typical form; on the contrary an all black moth might easily be perceived to be of simpler or less sophisticated design than one sporting an intricate camouflage pattern. Thus the case of the Peppered moth does not clearly adhere to the principle of increasing complexity.

Another basic principle underlying Darwin's evolutionary theory is the notion that a new form is more successful than the old. Accordingly we must ask, is the melanic form more successful than the typical form in the sense that it might one day come to supersede it? Surely this would be a pre-requisite for evolution to have been said to have taken place? But again the Peppered moth fails the test. The typical and intermediate forms are holding domination in many parts of the country and appear to have survival benefits over the melanic form quite unrelated to cryptic advantage. Were the whole of Britain to become heavily polluted with soot and sulphur dioxide then, yes, *carbonaria* might come to oust the typical form. On the other hand if this dreadful scenario were to become reality then the entire balance of nature would be thrown apart, and far from witnessing the origin of species we would more likely be seeing the mass extinction of them, Peppered moth and all!

If the case of the Peppered moth is not really an example of Darwinian evolution, might it be an example of the principle that Darwin believed led to evolution, the principle he described as natural selection?

Certainly the rise of industrial melanism might have been accounted for by some sort of selective factor, but was this selective factor "natural"?



To answer this one we need to define the meanings of “natural” and “artificial” selection. As with “evolution” and “adaptation” the boundaries have become vague. Perhaps the simplest distinction is that artificial means “manipulated by humans” while natural means “not manipulated by humans”. We think of natural selection as a process continuing through the eons influenced by geological, climatic and biological factors long before humans ever appeared. By artificial selection we tend to think of people deliberately interbreeding useful traits outside of the normal ecological constraints.

So which category does industrial melanism fall into? Quite simply industrial pollution is not a natural environmental factor. “Breeding” and “industrial melanism” are both forms of artificial selection, the only difference being that in the former the genes are being selected directly whereas in the latter the genes are being selected indirectly as a result of manipulating the environment.

Of course we can imagine parallels between artificial selection and natural selection but they are not one and the same. Darwin made use of the reality of artificial selection to bolster his “theory” of natural selection giving rise to evolution. Artificial selection is a concrete fact, we can plan it, do it, control it and see it. Natural selection is considerably less tangible, for how much of the living world is actually governed by it and how much we simply wish to interpret that way is entirely subjective.

Continuing on the theme of processes which might give rise to evolution, do the two distinct forms of the Peppered moth offer future potential for divergence into separate subspecies and ultimately separate species? Evolutionists refer to the existence of varieties, forms and aberrations as one possible route to the origin of species. However in the case of the Peppered moth this would be extremely unlikely because it is such an ubiquitous and highly dispersive insect. The distribution of the two forms is patchy and not always clearly defined, and then of course individuals of the typical form migrate into areas dominated by the melanic form and vice versa (Berry 1977). Now if a subspecies is going to develop it needs to be isolated from the main population by some kind of climatic or physical barrier in order to prevent continual interbreeding, and it is assumed (even by evolutionists) that the isolation must abide for a long period of time, perhaps a thousand years or more. Since no such barrier exists between the two forms it seems impossible to envisage how they might become separated into discretely inbreeding populations. The clear separation would be further perplexed by the existence of the third intermediate



form, with all three forms currently interbreeding and intermigrating. The potential for subspeciation therefore seems non-existent.

Earlier in this discussion I used the phrase "genetic swing" and I would now like to give this term a special meaning. I would like to define genetic swing as a change in proportion of individuals expressing a given trait, but not a trait entirely new to the population. As such I believe this term may be applied to describe what occurred in the Peppered moth. In part one of "Evolution the modern obsession" I drew a distinction in meaning between adaptive and evolutionary processes. I found this necessary because some adaptive processes do not offer the potential for crossing the species barrier. Briefly summarised, I kept the word adaptation for changes that made use of genetic material that already existed in the species gene pool, and used the word evolution for changes that made use of uniquely new genetic material that previously had not occurred in the species. Using this distinction we can understand that "genetic swing" falls into the category of an adaptive process rather than an evolutionary one. All in all the Peppered moth seems to fail every single criterion for inclusion under the meaning of evolution.

In conclusion then the case of the Peppered moth is neither an example of evolution in action nor of natural selection; it is in reality merely an example of "genetic swing" and of artificial selection brought about by human interference with the environment. Furthermore, the melanic form currently offers no potential for future divergent evolution from the typical form, nor for superseding it.

One wonders how many other claims to evolution, past and present, don't really stand up to close scrutiny. The modern obsession means that evolution is read into every slight event, change, development and discovery, be it human, animal, vegetable or fossil. We have lost perspective of the sense and limitations of Darwin's original thinking to the degree that it has become blind faith. Genetic engineering is now being heralded as "the next step in evolution". Call it evolution if you like, but it is not a process which could in any way account for the origin of the earth's thousands of insect species by natural phenomena.

In part 3 of "Evolution – the modern obsession" I will be grappling with another great evolutionary myth, namely Batesian mimicry.

References

- Berry, R.J. (1977). *Inheritance and Natural History*. Collins.
Stainton, H.T. (Ed.) (1855). *The Entomologist's Annual for 1855*. John van Vorst.



An early morning in the Sierra Nevada, Spain

by Matthew Rowlings (9108)

3 Great North Road, Alcolnbury, Cambridgeshire, PE17 5ES.

The destination of our 1992 family holiday was the mountains of the Sierra Nevada in southern Spain. We flew to Malaga on 21st June and picked up our hire car in the cool dark weather that welcomed us. After driving for three hours we arrived, in pouring rain and dense fog, at our villa situated in the village of Pampaneira at the western end of the Sierra. Fortunately the “guaranteed” sun appeared three days later and with it our first butterflies – the Cardinal (*Pandoriana pandora*) and a colony of African grass blues (*Zizeeria knysna*) on our front lawn. The butterfly mix in the Sierra Nevada (and in Andalucia more generally) is unique with many species at the southern edge of their range, while others are at their most northerly point.

The Sierra Nevada is Europe's second highest mountain range, after the Alps, with Mount Mulhacen peaking at 3480 metres. Its southern latitude means that even at these heights the snow has almost cleared from the south facing slopes as early as the beginning of July. Surprisingly there are only two species of *Erebia* on these mountains in contrast to the tens of species on the more northerly mountain ranges.

We were disappointed by the level of human disturbance through extensive farming, quarrying and primitive waste disposal methods so, as there was very little undisturbed lowland to investigate, we concentrated up our mountain valley rather than down. Beyond the last village in the valley, the road continued for a further one hundred kilometres, with its highest point of 3000 metres around the distinctive wedge shaped mountain Valeta (3300 metres), eventually arriving in the famous Moorish city of Granada. Not surprisingly this is the highest road in Europe.

One of the region's rarities is the Nevada grayling (*Pseudochazara hippolyte*); the nearest known colony outside Andalucia is over 4800 kilometres (3000 miles) away in southern Russia. Higgins and Riley comment on its European distribution mentioning Mount Mulhacen in particular and flying between 2100 and 2700 metres. The “high road” very conveniently passes right under a shoulder of Mount Mulhacen. In addition to the Nevada grayling is the Nevada blue (*Plebicula golgus*): “known only from the Sierra Nevada, flying at 2100-2400 metres in July”. Certainly something to further whet the appetite, even if the end of June may be a little early to start looking.



Peter and I decided that these beasties really did have to be looked for and to further dramatise our expedition we decided to try to beat the sun up and watch it rise over the Sierra.

On the 28th June we were up and away by 6.30am and as we came out of our narrow valley and into open regions of large rounded mountains the light levels went up dramatically; we knew the race was on to see the sunrise. It was also much cooler than in the valley and the car heating had to go on. The tarmac gave way to a dirt track which made the going much slower and as the road climbed gradually we eventually came out of the conifer plantations to see the sun already up and a haze spoiling the view over the peaks.

We stopped the car just before 8.00am at an altitude of 2200 metres. Stepping outside made us catch our breath because it was very cold, possibly only a few degrees above freezing. Coupled with the altitude any activity left us short of breath, so armed with jumpers and a butterfly net, we walked slowly on through the barren landscape. The vegetation was low – broom, heathers, thistles (rather like sea thistle in appearance) and sparse grasses. Plants in flower were confined to very sheltered areas and the occasional stream-side bog. It was very quiet with only wheatears, skylarks and the occasional chough and tawny pipit breaking the silence.

Even at these low early morning temperatures a small psychid moth was flying in reasonable numbers. However, it was one and a half hours before we saw anything else move. The chill had left the air when the first of several Painted ladies (*Cynthia cardui*) and Small tortoiseshells (*Aglais urticae*) put on a show. Then Red admirals (*Vanessa atalanta*) and Humming-bird hawk-moths (*Macroglossum stellatarum*) began to appear. The sun was hot which made up for the cool air which probably didn't reach 18°C even at midday, but by 10.30am we decided that we should be seeing "other things" but very little was happening.

We were walking along a broad ridge between two mountains when we felt a blast of warm air coming up from the valley below. The blasts were a source of variety on the butterfly front. It's not often at 2900 metres that you find Cleopatra (*Gonepteryx cleopatra*), Marsh fritillary (*Eurodryas aurinia*), Meadow fritillary (*Mellicta parthenoides*), Cardinal (*Pandoriana pandora*) and Nettle tree butterfly (*Libythea celtis*) as singletons and Clouded yellows (*Colias crocea*), Small whites (*Pieris rapae*), Bath whites (*Pontia daplidice*) and Queen of Spain fritillaries (*Argynnis latonia*) more frequently. Painted ladies, Red admirals and Small tortoiseshells were also found in this area.



Migrant species are well represented in this list and these gusts must help them to cross mountain ranges. However, sedentary species are also brought up with the hot air so this may be important in the spreading and reinforcement of colonies in neighbouring valleys. It probably homogenises the populations in nearby valleys that would otherwise not mix. This may be why new species and subspecies are not found in apparently isolated valleys as often as might be expected.

The source of the hot air was the town of Trevelez, the highest town in Spain at 1600 metres, almost 1.5 kilometres below us. The sight really made the toes dig in as the ground just sloped down, down and away. At 2900 metres we were getting too high so we turned back towards the car and covered the ground that we passed in the cold of the morning.

Back in the published altitude band for the Nevada grayling several huge queen ants made an appearance, their grotesquely swollen black abdomens measured four centimetres in length. They were trying to burrow into the hard ground, but with time pressing we couldn't wait to see if they were successful, but given the whole afternoon they presumably managed it before dark.

With skin scorched by the penetrating Mediterranean sun and the thin atmosphere we unfortunately made it back to the car without seeing either target species. It was disappointing not to see the Nevada grayling but we were resigned not to see the blue. The poor spring weather may well have been the cause for a poor or late season, although its effect was not obvious in the low(er) land species.

There was one more treat awaiting us on our descent. We stopped off at a marshy spot at about 1500 metres for a quick look and found two large Idas blues (*Lycaeides idas*) and a stunning female Morocco orange-tip (*Anthocharis belia*). Despite missing the Nevada grayling it was a memorable morning spent in a truly stunning and invigorating environment.

Five days later we tried a similar excursion on the northern slopes of Mulhacen. The countryside was much greener and more alpine than the dry southern slopes, but once again we didn't find either "Nevada" species but added a few more species to the list – notably Amanda's blue (*Agrodiaetus amanda*) and the Black-veined white (*Aporia crataegi*).



Update of Buprestids in the Hoddesdon/Broxbourne area

by Maurice Pledger (10214)

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Following the articles on my findings of *Agrilus* species in and around the Hoddesdon and Broxbourne area in Hertfordshire, I thought it was about time I had an update. It's the 2nd of May 1999, and I've spent a great deal of time since last year trying to find out more about the buprestids in our area. As I mentioned before, I spend a lot of time walking the countryside round here with my dog Bunny, and as the *Agrilus* species tend to leave outward signs of their presence, my perseverance has been paying off. I repeat again that all this is guesswork on what I've been able to find, and with the great help from my good friends Phil Jeffery and Rob Dyke, the three of us have been piecing together the jigsaw. Very little is actually available regarding writings on buprestids, and then what is written is very skimpy, leaving you with more unanswered questions than answers. Trying to track down these little things is just like looking for clearwing moths. You find signs of presence, but it's very difficult to say how old these signs are. As with all holes in wood, you may be looking at a hole which was occupied twenty years ago, or more.

It seems as with most *Agrilus* species, they are attracted to distressed trees, and judging by what we've seen, they tend to occupy trees which are either on their own, or at the very least catch a fair amount of sunshine. They are definitely sun-loving insects, the warmer and sunnier the greater chance of seeing them. I'll take each species in turn, writing what we've managed to find out so far. I'll add here that we're at a point where we're waiting for things to hatch, so another update will be tagged on the end further down the line.

Agrilus sinuatus (hawthorn)

As mentioned before, last summer I'd found lots of hawthorns with the typical "D" shaped exit holes of *sinuatus*. All through the winter I'd been looking for new trees with them in. Some trees would have an odd hole here and there, to the other extreme of an old dead hawthorn, twisted and contorted with age, on the edge of a housing estate in Cheshunt, which was absolutely riddled beyond belief. In amongst the meandering old larval tunnels in the hard wood under the outer bark, were the "D" holes. At first this in itself posed the question



of how could a long beetle (11-12mm) exit at right-angles to the trunk or branch, if all the larval tunnelling were flat and shallow, just below the thin bark? Without too much thinking, and looking at a section of tunnelled wood I'd shown him, Phil put forward his idea that the larva would ultimately bore down into the hard wood to make its pupal chamber. Looking at various sections of branches I'd say this is exactly what happens. What I'd put forward is this. The adult beetle lays its eggs singly, here and there probably near tiny cracks in the outer bark, so the tiny larva, after hatching, can easily eat its way down into the thin bark. This done, it spends its larval life meandering along, in between the bark and the hard wood, the width of the tunnels increasing as it gets larger. The tunnels are very flat and are filled with fine dust. The actual larva is very flat when viewed from the side, with an enlarged wide head. The larva actually seems to eat very slightly into the underside of the bark, and the very surface of the hard wood. At the very last stage, the larva then heads down into the wood (see later under the heading of *angustulus*) where it prepares its pupal chamber, from where it will eventually emerge, chewing through the thin bark above it, leaving the tell-tale "D" shaped hole.

Reading that *sinuatus* is on the wing from May onwards, I decided to cut likely looking branches in the hope of rearing out the adult beetle. I cut various sections, placing them outside in a large garden container with damp sand in the bottom. I then placed a large cylindrical net over the top, thus sleeving them all. Rightly or wrongly, I placed them in the sunshine, as they would be in the wild. I was doing this when I stumbled on how to deduce whether or not a cut section was inhabited.

I started cutting sections about mid-April. I picked a tree which had obviously had *sinuatus* in for many years, the old exit holes could be seen in all ages of the wood. There were holes in old long-dead sections of the tree, as well as the very scaly bark of the main trunk, less-scaly branches, and even found smooth branches. On cutting through a 5cm diameter young branch which came out of an older branch, I found that I'd sawn through a fresh tunnel. I peeled away the fresh bark on the new branch and saw the meandering tunnel going along, getting wider, until it disappeared under some bark which I hadn't peeled away. There was *no* exit hole on this branch, suggesting to me that it was a new tunnel with the larva still in residence. Since this discovery, I've tried gently slicing away a little fresh bark here and there on likely-looking branches, and found several tunnels in the exposed hard wood. I will add here that the wood is so fresh that it's soaking with sap. It seems that although the beetle is attracted to



distressed trees, the larva feeds in new branches which are very fresh. I've found some channels which are in their infancy, being very small and narrow, I suppose next year's beetles? The best looking branches are sun-exposed ones even down to about 3cm thick. The baby tunnels are very haphazard and sometimes go in a straight line for a while, whereas the larger they get, the more purposeful the meanderings. I've sleeved a few of these, and hopefully in two or three weeks time, I'll get lucky with emerging adults.

Agrilus angustulus (hornbeam)

As promised, the rangers had left the two cut piles of hornbeam logs intact from last summer. These had previously been cut and piled in the autumn of 1997 (read the article "Buprestids in Broxbourne Woods"). The log piles are in a lovely sunny position in a coppiced area. As we'd seen and filmed *angustulus* pairing up and egg-laying on these logs in the summer, it was interesting to see if the resulting eggs would see it through to this year successfully. Dan Hackett had told me that *angustulus* was only known to have bred on living trees, so it was important to keep these logs intact to see what happened this year. I know the stacked logs had obviously attracted the adult beetles in numbers throughout the summer up to and probably beyond the end of August 1998, but it seemed strange to me they didn't fly back up into the surrounding living hornbeams to lay eggs. Surely they would have sensed it would be futile to lay on logs if the eggs wouldn't come through. Anyway, on the 27th April, a few days ago, Rob and I went to have a look and peeled away sections of the uppermost logs on which we'd seen adult beetles egg-laying. The bark which had seen most sun was already split and peeling. When pulled away from the hard wood, only other bits and pieces were found – woodlice, bugs etc. and two or three small whitish longhorn beetle pupae. We peeled away sections along the *sides* of the logs, which were damper, and it was here we found healthy larvae which had been tunnelling inside the bark, which viewed from the underside is very ribbed and you could see their channelling following the lines of the grain. Some fell out, some could still be seen, in place inside the bark. Some were larger than others, obviously in different stages of growth. They were between about 3mm up to about 10mm, the larger ones being whiter and denser in colour. There were another two which seemed very thin and longer, perhaps 12mm with very wide heads, which dare I suggest *may* have been another species. They were both slightly bruised and subsequently died. These two came from the smaller log pile which is the only place we saw *Agrilus sulcicollis* – so maybe? However, that said, we only



saw *angustulus* egg-laying, so I don't know. Of course it doesn't mean they didn't, only that we didn't see them. We took a few back, and are keeping them in a small enclosed container together with some moist moss to see what happens. To date all seems well. We noticed on an older log pile round the corner, actual "D" shaped holes in the outer peeling bark, as on the hawthorns of *sinuatus*. Peeling back the dried bark, were the holes going into the hard wood, exactly the same as *sinuatus*, however with less tunnelling in the hard wood. Were these successful emergences from previous logs, or were they emergences from the living tree before it was cut?

I returned to the log piles with Phil today (2nd May) and found a few more larvae, when I noticed a movement on the hard wood of a log from which we'd just removed a section of thin damp bark. It was an actual larva in the process of tunnelling down into the hard wood in the final stage of making its pupal chamber.

The tail was visible, waving around. We photographed it, and cut away the section and I am looking at it now. It is 12.45am (Monday morning). We found it with the already started tunnel about 1pm Sunday afternoon. It has been going at it for more than 12 hours. There is now a fair amount of sawdust issuing from the hole. The tail tip is still visible. When I returned home with it, it had obviously turned around as the head was visible. I video'd it with both the head and tail showing. It must bore down, construct the chamber, in such a manner so it can turn round and face outward prior to pupating. (?) I am eager to see how long the pupal stage lasts, and hope that it goes through to adult successfully. From what I can make out, from the amount of tunnels in the hard wood around the final chamber (and the other exit holes on the older log) what happens is this. Again, I'm just guessing from what I've seen. The larva spends most of its life inside the bark layer. We found them in here in all sizes. When the larva gets larger, it starts to make flat channels also in the hard wood for a while, then it goes into the hard wood to construct the final chamber from where it will exit. The channelling in the hard wood is nowhere as elaborate as *sinuatus*, however it does "wave around a bit" in various directions, almost as if it's looking for a place which is just right before it tunnels down. Even with the outer layer of bark itself being paper thin, you don't get any indication that there is a larva underneath. Unlike a particularly smooth branch of hawthorn I cut, where you could see a slight raising of the bark of the meandering channels of this particular *sinuatus*. The visible channel which looked just like a varicose vein was about 12cm long. It is sleeved up at the moment with the rest.



***Agrilus panonicus* (oak)**

We have since found many infested *dead* oak trees with the tell-tale "D" shaped holes around the base of the trunk, and even going up to about six feet or so. These are usually on one side of the trunk. The older, deader the tree is, the more holes, given that there's a fair infestation anyway all things being equal. Usually on these oaks, they're so far gone, you can rip chunks of thick bark off by hand. In extreme cases, half the side of the tree will come away in one go. All tunnelling appears to be within the old bark itself, the "D" hole does *not* continue through into the wood beneath. I have found only one oak so far which has the odd hole, and a still solid bark. I'm hoping there are still beetles inside yet to hatch. I have yet to find a tree with holes (up to head height anyway) that has any leaves on it, they all seem to be totally dead. I have taken chunks from this last mentioned tree, and bagged it all up, to await a possible hatching. I have found no dead beetles wedged in the holes as I had last summer with *sinuatus*.

17th August 1999 – latest update

Agrilus sinuatus: Great success! Between 19th June and 2nd July I had twelve *A. sinuatus* emerge from the sleeved-up hawthorns. Plus a bonus male Leopard moth on the 1st July. A few abortive attempts at beating the hawthorns where I took these sections yielded nothing.

Agrilus angustulus: The larva which was happily tunnelling in the hornbeam eventually quietened down and I awaited a great emergence a little while later. To my great surprise at the time of writing, it has been throwing out dust like a maniac so who knows what's going on! Other "D" shaped holes on the logs which I'd sectioned off and brought back appear to be still dormant. All the other white larvae turned out to be small longhorn beetles, but these pupated in between the hardwood and thin papery bark. The thinner larvae with large heads which I mentioned (and had died), seemed to be of the type which we saw burrowing and is still going mad now. These I am almost sure are buprestids, but what species I don't know. We'll have to wait and see.

Agrilus panonicus: No luck at all with the oak bark sections, but I did net one at the log piles on 26th June, along with a *laticornis*, *angustulus* and *sulcicollis*, all within three minutes and not getting off my knees! Again, *angustulus* was out in numbers from 9th June with a few odd *sulcicollis*. They were more interested in fresh cut and stacked hornbeam logs, the main piles seemed to have lost their appeal for the flying adults.



An observation on the natural history of *Coreus marginatus*

by Fiona Vass (11298)

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Introduction

To succeed in evolutionary terms means breeding successfully and the offspring surviving long enough to carry on the parental line. Like foraging, sex draws creatures into the open to find, court and battle with rivals. This often public behaviour was witnessed in the field whilst observing the mating rituals of *Coreus marginatus*. The insect was forsaking all risk of predation and being sexually cheated, to satisfy this overwhelming drive to breed.

This paper is the result of a survey to locate and observe the mating rituals of *Coreus marginatus*. The survey areas were located in Garston Lane, South Warnborough, Hampshire, OS sheet 186, grid reference SU723478.

The survey took place over three days, in which time a total of eight matings were observed on two sites. On 25th April the area was observed to establish the location of the shield bugs. On 26-27th April the shield bugs were observed for three hours in the morning, 9am-12pm, and afternoon 1pm-4pm on both sites.

Ecology of *Coreus marginatus*

The squashbug, *Coreus marginatus*, is a member of the order Hemiptera of which some 1,700 species occur in Britain. Hemiptera are split into two distinct sub-orders. Homoptera and Heteroptera – the latter are generally referred to as the “true bugs”. The heteropterans include both plant and animal feeders, and all the water bugs, both surface dwelling and submerged. *Coreus* is an heteropteran belonging to the family Coreidae.

Coreus marginatus adults have a dull brown colour, a narrow oval body line and measure about one centimetre in length. The head is small in proportion to the pronotum, the forewings are horny at the base and membranous at the tip. Members of the *Coreidae*, have four segmented antennae and are coloured various shades of brown. They occur on docks and related plants, feeding on seeds and fruits, especially *Rubus fruticosus* agg. As a family they are known as squashbugs because several are pests of squashes on North America. *C. marginatus* hibernates as an adult and is most often seen in the autumn and spring.



Hemipterans are hemimetabolous, so they do not go through a pupal stage in their development. There are usually five instars, during which time the nymphs become more like the adults. Initially, colour of the nymphs may be different from the brown of the adults. The nymphal foodplants are members of Polygonaceae, including *Rumex* species. The nymphs show cryptic coloration, they resemble the seeds of their host plants.

Considering the widespread availability of their foodplants, the Coreidae have a markedly southern distribution. This could indicate that climate, as well as food availability, is important.

Description of the survey sites

The object of the survey was to locate and observe the mating behaviour of *Coreus marginatus*. The sampling points were determined by observing the vegetation to locate more than three individuals per square metre. Two main mating sites were located on a sloping roadside verge, as follows:

Site 1 was situated around four feet up the slope and was dominated by cow parsley.

Site 2 was situated around two feet up the slope, centred by common dock and surrounded by nettle, and dead nettle.

Both sites were southerly facing and received full sun for the majority of the day. For the duration of the survey, the weather was warm, bright and still during the morning observations. On the afternoon of day two, the weather remained warm, but became increasingly breezy.

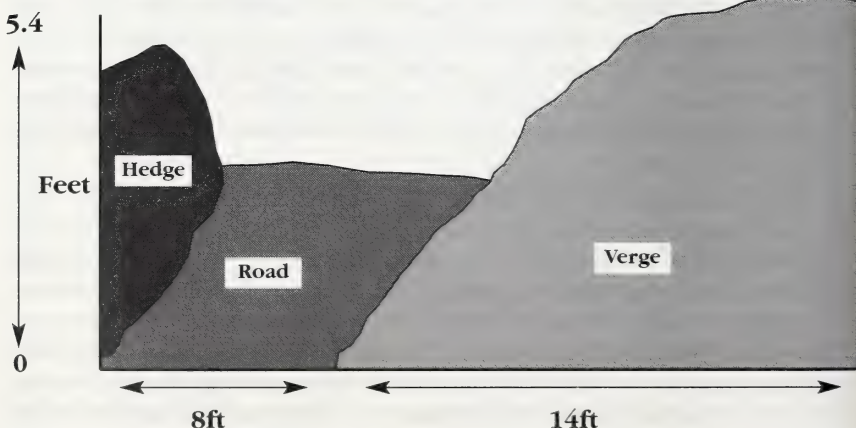


Figure 1. The dimensions of the verge.



The survey area was dominated by cow parsley, *Anthriscus sylvestris* along the length of the verge, with common nettle, *Urtica dioica*, white deadnettle *Lamium album* and broad leafed dock, *Rumex obtusifolius* being frequent. The verge backed onto a grassed playing area. On the opposite side of the road was a five foot high flat-topped hedge of *Crataegus monogyna*. This bordered a wheat field. The base of the hedge was dominated by common nettle and white dead nettle. These were interspersed with occasional cow parsley plants. The hedgerow shaded the ground flora beneath it until mid-morning and from late afternoon, in contrast to the verge, which received the sun of the majority of day. The lack of *Rumex* species in the hedgerow area probably explains the absence of *Coreus marginatus*. Considering these two areas were separated only by an eight foot country road, and that the shield bugs can fly, it is surprising that there were no *Coreus* specimens on the vegetation below the hedgerow. This could be explained perhaps by the ability of the bugs to select only suitable foodplants as landing sites.

Coreus marginatus* on *Rumex obtusifolius

On broad-leafed dock the majority of matings took place on the top of the leaf, and were therefore easy to observe. However, when the weather became windy or overcast the bugs retreated to sunny sheltered pockets within the vegetation, making them harder to observe as once joined they moved, coming to rest between the leaf stalk and the stem of the dock.

The males were quite well spaced on the dock. Usually there is one male per leaf. This area was used by the males to bask in the sun. They also rocked themselves from side to side, which could last for an hour at a time. Territorial behaviour was only witnessed twice in this area. This occurred when two males were sharing a leaf and were around four centimetres apart. The aggressor male approached the other male and they locked their legs around each other. They then repeatedly rocked and rolled each other quickly and violently onto their backs. This continued until the aggressor finally retreated to his original position, where he deposited a yellow chemical on the leaf before departing.

Usually the females were placed two or more together on leaves opposite to the males. The other female(s) would depart when the pair had completed their mating routine. The stages of courtship observed were:



1. Male and female sit at right-angles to each other about four centimetres apart. After some time he walks over to her but remains at the same angle.
2. He strokes his antennae over her abdomen, at which point some females fly off (and he focuses his attention on female 2), or after what seems to be a conversation through their antennae (which always seem to be in opposing positions), and their front legs. She walks around the edge of the leaf to his original position, and he moves onto her spot.
3. After some time she walks in front of him, he walks over her and does the mating route, stopping very close to the female at a 90° angle. He then rocks, reverses round to face her head on and they communicate through antennae and leg movements and stroking (exit female 2).
4. The males then reverses anti-clockwise and mounts the female. Some females then rest on their sides exposing their undersides. When the female returns to a standing position the male often moves so they look like a horse-shoe shape.
5. They remain in this position for 20-38 minutes.
6. The females usually fly away after mating but the males remain on the plant.

The mating ritual from male to female sharing a leaf to the female's departure could last from 40 to 70 minutes.

Opportunist males

A mating pair seems to be an attractant to opportunist males who:

1. Walk the female mating route (which suggests she leaves a pheromone trail), and over the mating pair. After the second route, he mounts and rocks the mating female quite violently.
2. If the mating pair come apart the opportunist immediately tries to mount the female, whereupon the original male retaliates.
3. In the majority of cases the female vacates and leaves the males to battle ending with only one male on the leaf.
4. The victorious male then returns to rocking on the mating spot, either to attract females or deter other males.
5. Males also lurked on the underside of the leaf and rocked the mating females.



Coreus marginatus* on *Urtica dioica

Given the smaller surface area of the leaf, the mating route observed on *Rumex* was lacking on nettles, although males would often rock the female from the underside of the leaf. They seemed to observe each other from opposing leaves:

- The male walked onto her leaf and sat at a 90° angle (as witnessed on dock), but was closer such that his antennae reached the membranous tip of her abdomen.
- Some females reacted by quickly opening and closing the wing case nearer the male, others vacated the leaf, or retreated to the underside of the leaf.
- If the female stayed he continued to rock and stroke her with his antennae, until she moved forwards. He then reversed round, abdomen first, rocking and stroking her. Then he attempted to mount her (this step could be repeated three or four times before the female accepted his advances).
- They remained joined for 15-35 minutes usually with both parties retreating separately into the undergrowth.
- Almost immediately another male took the vacant leaf.

Unlike the situation observed on *Rumex*, clashes between rival *Coreus* males were not witnessed on common nettle, although males would rock mating couples from the underside of the leaf. This absence may be due to the smaller leaf area of nettle. However, there are more leaves per nettle plant, which means that a larger number of display and mating sites are available.

Conclusions

The duration of copulation may be an indicator of breeding success, given that couples remained joined for between 15 to 38 minutes. During the survey, successful matings were interpreted as those lasting for more than four minutes from the beginning of copulation. Six such matings at site two were observed, four between 9am-12 noon and two between 1pm-3pm. Only two matings were witnessed on site one, both between 9am-12 noon.

Thirty-seven individuals were observed on site one and twenty-two on site two. Some of these may have been counted twice, as they were not marked and released (this would have been done if the experiment were to be repeated for the whole of the breeding season).



Similarly, the individuals observed on day two may have been the same individuals observed on day one, as it is not known whether both sexes breed more than once.

There were overlapping characteristics on both sites:

- Males rocked themselves prior to and during mating.
- Opportunist males lurked close to a mating couple.
- Movement of females around or under a leaf occurred during courtship.
- The antennae were always opposite in position, depending upon sex. In the female they are usually in a forward and downward shaped V, whereas in the male they form an upwards V.
- Females may leave the male half way through courtship (suggesting she chooses the mate).
- Duration of courtship and mating was similar.
- Chemical, visual and auditory communication signals were observed in both areas.

Opportunist males, through their lurking and rocking of mating couples, may stimulate her and other females in the vicinity.

Given that the study was limited to two days, no concrete conclusions can be drawn, due to insufficient data. The survey would need to be conducted for the entire breeding season over a variety of sites and the individuals marked and re-released in order to:

- assess the size of the population per plant
- ascertain if either sex mates on more than one occasion
- determine if individuals return to the same plant after mating
- assess whether the rocking behaviour observed was to attract a female or an aggressive display.

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Insects at Fraser's Hill and the Semangkop Pass, Malaysia

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This visit of a week in September 1999 was my third to this locality situated in the rain forest covered hills north of Kuala Lumpur. I stayed once more at the government resthouse at the Semangkop Pass (formerly known as The Gap) below Fraser's Hill and was glad to find this relic of the colonial era still unchanged – it has enormous bedrooms and inexpensive board and lodging and is mainly patronised by naturalists. It was also good that access up to Fraser's Hill township was still possible only via the narrow twisting one way road through the forest from the Pass. The highway to link West Malaysia's hill stations, which is currently under construction, threatens soon to destroy the isolation and peace of this area.

Both the Pass and Fraser's Hill are well known bird watching localities and they are also rich in insects. The Pass, at 2,250 feet altitude, is in fact, near the optimum level for biodiversity in Malaysia which is generally considered to be around 3,000 feet altitude. It is at this level in the hills that lowland rain forest, dominated by trees of the Dipterocarpaceae, merges into lower montane rain forest that includes trees of such families as the Fagaceae and Myrtaceae that may be more insect palatable. Among the Fagaceae are oaks of the primarily North Temperate genus *Quercus*, along with the closely related *Lithocarpus*. It was strange to find acorns lying on the ground amongst the rain forest trees at 4,200 feet altitude on the summit of Fraser's Hill and, in September, I discovered oaks growing in lowland-type forest as low as 2,200 feet altitude when I came upon a troop of leaf monkeys feeding on the bountiful crop of acorns on a tree near the Pass. Walking up the Fraser's Hill road a couple of days later I came upon some fallen fruits almost identical to the nuts of the sweet chestnut and chinkapins (*Castanea* spp) of Europe and North America. *Castanea* does not occur in Malaysia but the related *Castanopsis* does and I assumed that these fruits came from a tree of that genus. If so, then it seems that all four genera of Malaysian Fagaceae ie *Lithocarpus*, *Quercus*, *Castanopsis* and *Dryobalanops*, occur on the hills around Semangkop Pass, with *Lithocarpus* represented by several species.

When I last stayed at the Semangkop Pass in May 1997 the early effects of El Nino were causing unusually dry weather. Bird life was quiet at that time and, disappointingly, no hornbills were seen.



However, despite the unpromising conditions, I found insects to be quite abundant then, especially moths, which came in hordes and in great variety to the two street lights at the Pass. In the evening the light of the lamp post next to the resthouse would be surrounded by a blizzard of bats and insects. Around 50 or 60 different species of moth would fly to the light each night between 7.30 and 11.30 pm (when the generator at the Pass is turned off and all lights go out) and each night would bring an almost completely different assemblage of species to those of other nights. Despite the variety of moths the numbers of individuals of each species was small, in fact of only three species were more than one specimen found. These were *Xyleutes stryx* (Cossidae), *Lebeda cognata* (Lasiocampidae) and the saturniid *Attacus atlas* (the Atlas Moth). *Attacus* was actually the most frequently seen moth in the area with one or two turning up on most nights.

In September 1999 the weather appeared to have returned to normal and rain, sometimes very heavy, fell intermittently during the seven days spent here. Insects, however, were rather less numerous than in May 1997 and came to the lights in only small numbers (apart from a species of ant of which winged alates swarmed around the resthouse lights for the first three nights and would rain down onto the tables in the dining room) but I believe that September is past the peak period for insect variety and abundance in Malaysia. I counted only 12 species of moth at lights on the first night and there were not more than one of each kind. It was much the same on all subsequent nights. Today they included one Atlas Moth, a male of *Lebeda cognata* and two kinds of sphingid, one of streamlined form and distinctive for the bright orange underside of the body. *Lebeda* is of quite robust form in two shades of grey, the fur on the pronotum thick and fluffy and there is a small bright white spot on each forewing. A male of this species (perhaps the same individual) appeared again on three other nights.

Because the lights at the pass all go out at about 11.30 each night, virtually every single insect flying to lights in the evening disappears by the morning. However, one morning, when I went out just after first light, I was lucky enough to come upon a male Atlas moth resting at the bottom of a wall. He was a magnificent specimen, probably freshly emerged. His wings spanned about nine inches, coloured with varied shades of rich red-brown crossed with narrow wavy lines of black and white; the tips tinged with ochre yellow and pink and with a suggestion of an eyespot. The body was red with each abdominal segment edged with white. All the other Atlas moths that I have seen here were already to some degree faded and tattered after battering themselves around the lights and against any obstacles close by. After I had taken a few



photos the moth started to become active so I carried him over to the forest edge where he flapped clumsily around for a couple of minutes before lifting off to fly into the trees. *Attacus* was the only saturniid seen around the pass on this visit but the smaller, yellow *Loepa sikkima* was found at light in Fraser's Hill township at 4,200 feet altitude.

Moths found at light on subsequent nights included a *Zeuzera* sp (Leopard moth), a male *Xyleutes stryx*, the handsome arctiid *Pericallia galactina* which has a red body and white wings crossed by black lines; a large black *Erebus* sp (Noctuidae) and *Trichaeta apicalis* (Ctenuchidae).

Beetles were second to moths in the number of different species that appeared at the lights. In May 1997 there were far fewer beetles than moths but in September 1999 such was the paucity of moths that on one night they were outnumbered by beetles. As with the moths, only a single specimen was found of most beetle species and the most frequent species was also the largest. This was the huge *Chalcosoma caucasus* of the Dynastinae. Between one and three females of *C. caucasus* turned up every night, both in May 1997 and September 1999 but males were seen on only one occasion when two flew to the lamp post on the same night in September. The first to turn up was disappointingly a diminutive individual much smaller than the female beetles and with horns on the pronotum and head present as mere nodes. The other was a large specimen nine centimetres in length and with the horns quite well developed. The black integument of this male was smooth and polished with a green sheen on the elytra. He had two large horns pointing forwards and upwards from either side of the pronotum and there was a small forward directed horn at the front edge. The head had another long, curved, laterally flattened horn with two blunt spines. I don't know whether it was a coincidence that the only two males turned up together or whether it was the particular weather conditions that prompted them to fly that night. It was a warm night, partly cloudy after a day of light rain.

Males of *C. caucasus* can reach a length of 10 centimetres while the very similar *C. atlas* can be bigger still and may reach 12 centimetres. The latter species is said to occur at higher elevations in these same hills but I have never had the good fortune to encounter it. The genus *Chalcosoma* has only three species and occurs from north-east India to Borneo. The third species, *C. moellenkampii*, is confined to Borneo.

Two other large species of Dynastinae at light, both males, were *Trichogomphus lunatus* and the rhinoceros beetle *Oryctes trituberculatus*. The large, five centimetres long, melolonthine chafer *Eucirrus mellyi* appeared twice and one individual of *Catharsius*



molossus was the only dung beetle that I encountered in the area at any time (indicating that there must be few, if any, large mammals remaining in these forests). In May 1997 longhorn beetles were numerous at light, with the very large dark brown *Macrotoma pascoei* turning up every night. In September 1999 no *Macrotoma* were seen and only three longhorns were found. One of these was *Cyriopalus wallacei* that has strongly pectinate antennae which are most unusual in the Cerambycidae. Other beetles included two small brown lucanids of the genus *Dorcus*, a carabid and a species of Languriidae which is a small tropical/sub tropical family related to the Erotylidae that I had not encountered before.

Other insects at light included: three males of the earwig *Opisthocosmia centurio*, a slenderly built brown insect with long thin curved forceps; a couple of mantids, one of which returned on each of the three following nights; a golden brown crane fly (Tipulidae) found eating another small insect; large honey bees (*Apis* sp) and three pompilid wasps of different species. This is the first time that I have found Pompilidae (or solitary wasps of any sort) active at night and attracted to light.

During this visit to the Fraser's Hill area I discovered that ants were present in the hill forests in much richer variety than I had previously thought; possibly just as rich as in the lowland forest. In the forest interior I came across several different species of the genus *Polyrhachis* alone. This is a large genus of ants characterised by prominent curved spines on the propodeum and pedicel. One was the handsome golden haired *P. ypsilon* that was common in the primary lowland forest of the Malay Peninsula's main national park, the Taman Negara. Others of the genus included a bigger dull black species and one that had a dark blue gaster. Another kind of ant here that I had encountered in Taman Negara was *Meranoplus mucronatus*, an unusual slow moving ant in which the workers have a flat four-sided shield covering the pronotum, each corner of the shield being produced into a spine. Some other species of ant were found only at the lowest levels of the hills. The huge *Camponotus gigas* was quite common in forest up to around 1,250 feet altitude but probably does not occur above this level so it seems to be a completely lowland forest insect. The soldiers, or major workers, of this species are three centimetres long with the huge triangular head accounting for one cm. In the form here the minor workers (that do not have the greatly enlarged head) had a rufous-reddish pronotum and gaster whereas in the Taman Negara this species is all black. Leaf weaving ants (*Oecophylla virescens*) were encountered on the river bank at around 1,000 feet altitude but nowhere higher than this.



One morning winged mating couples of some large ant, that I was unable to identify, were scattered over the road. The females were polished black insects, about two and half centimeres long, with ample dusky wings, the head quite small with three conspicuous shining ocelli on the forehead. The males were much smaller than their partners and completely orange-yellow in colour.

It was odd that the common large social wasp *Vespa tropica* does not seem to be present at any level of the hills (and not in the Cameron Highlands either). This well-known tropical Asian insect is frequently encountered in the lowlands of the Malay Peninsula in a wide range of habitats. Smaller kinds of social wasps do occur in the hill forests, but are never numerous. There are many kinds of small bees up to seven millimetres long as well as a few larger bees. Of the latter, there are one or two species of honey bees (*Apis* spp) and I have found two species of carpenter bee (*Xylocopa* spp), one of these was all black, the other mostly black but with the pronotum yellow.

I think that termites are one group of insects that are significantly poorer in variety in the hill forests (and cicadas are another). The most conspicuous termites in the region, those of genera *Macrotermes* and *Hospitalitermes*, whose species are active in the open in daylight, are present in the hills but not in such abundance as in primary lowland rain forest. The seemingly endless columns of *Hospitalitermes* workers, all rapidly marching in one direction, several abreast and flanked by nasute soldiers, are reminiscent of the columns of driver ants of Africa but these termites are gatherers of lichen rather than animal prey. Species of this genus were found in the lower montane forest up to around 4,300 feet altitude.

About seven kilometres from the Gap Resthouse, I discovered a long track that led down into the valley and the along the river (the name of which I have yet to discover). There were various leafbeetles of the Cassidinae, Hispinae and Halticinae on foliage along the track. In Malaysian tortoise beetles, such as *Aspidomorpha* and related genera, the elytra and carapace of the pronotum are transparent and expanded into flanges that give the insects a completely circular shape. The cuticle of the body is constructed of thin layers of chitin (known as multilayer reflectors) in such a way as to create metallic reflections of light, usually green, red or gold, to an intense degree through the elytra so that the little beetles can be quite conspicuous as they cling to the leaf of a shrub. In one kind that I found here, *Rhacocassis flavophagiata*, the brilliant iridescence of red and gold was such that the insects shone like tiny lights in the deep shade of the forest.



It is believed that this iridescence attracts conspecifics for mating, rather as some tropical butterflies of the forest interior have patches of glowing purple on their wings (interestingly, iridescence has been developed in certain marine crabs of the genus *Ovalipes* that live in deeper water and it is thought that this too is in order to attract mates in an environment of low light levels).

Other tortoise beetles found were *Aspidomorpha miliaris* and *A. fuscopunctata*. The former is quite large for this subfamily and has the shiny transparent elytra boldly spotted with black; it occurs from India to south-east Asia. The structural colours in all these tortoise beetles can only be appreciated when the insects are alive as they fade soon after death to a dull grubby green.

The Hispinae were *Dactylispa perrotati*, *Gonophora integra* and another species of *Gonophora* which I was unable to identify but was closely related to *G. pallida*. *Dactylispa* is a small beetle that is densely covered in spines; some on the pronotum are forked. There are very similar species to this one found from North America and Europe to Australia, and from cool temperate to tropical climates, but most of this subfamily have no spines, as was the case with the other two species that I found here, but, instead, have raised striae or reticulations on the elytra. The group appears to be most diverse in tropical South America where some spineless forms reach 38 centimetres in length.

There were two species of Halticinae (flea beetles) found, both dark red and both of the genus *Sphaeroderma*. One, *S. sumatrana* was only one and a half mm long and completely round in shape. The other species was larger; I identified this as probably *S. semiregularis*. A spiny weevil, *Paraplapoderus hystrix*, was also common feeding on the leaves of some kind of shrub, taking readily to flight when disturbed.

In the hot sunshine there were many butterflies about one of which was particularly striking. This was *Cethosia hypsea* (Nymphalidae) that was quite common in the area at this time. It has a broad crimson area at the base of the wings and the rest black marked with white. An *Idea* sp., with large flimsy looking pale grey wings with black veins and spots, floated over the vegetation in the usual lazy manner of this genus; there were Crow butterflies of the related nymphalid genus *Euploea* whose dark wings have a purple sheen, small bright Grass yellows (*Terias* sps) and some satyrids, probably of the genus *Ypthima*, with grey-brown wings, marked with small eye spots.

Urine on the sand beside the small rushing river at the bottom of the valley (at about 1,500 feet altitude) quickly attracted several male *Appias lycinda* (Pieridae), which were immediately identified by the



dark brown and bright yellow on the underside of the hindwing. They were soon joined by a Kite swallowtail (*Graphium sarpedon*), an unidentified brown nymphalid, a lycaenid and some small bees. These insects stayed to feed for some time – for all the 20 minutes that I sat there. A glorious male Rajah Brooke's Birdwing (*Trogonoptera brookiana*) made his way downstream with the strong, purposeful flight characteristic of this species, while damselflies, with shining green wings glinting in the sunlight, flitted low over the water, sometimes perching on a rock in mid stream.

Trogonoptera seems to be on the wing at all times of the year and, unlike other groups of insects, butterfly variety seems less affected by season in Malaysia. Year round rain fall and humidity and constant warm temperatures allow butterflies to breed continuously.

As I walked back to the pass from the track at dusk, little bats flitted over the road and parties of dark swifts swooped past me, flapping their wings with a swishing sound to propel themselves at speed down into the valley. Three Malaysian eared nightjars flew over in the half darkness, sailing out across the valley calling loudly in a musical "kwee-kwee-kweeoo". Sometimes they flew close to each other, two almost meeting at one time. Then as I approached the resthouse I suddenly found myself surrounded by little swiftlets that swirled around me, sweeping in circles low above the road. They seemed oblivious of me as I stood in their midst and sometimes the little birds flew so close that I could nearly touch them.

It was not until the last hour of daylight on the final evening that, at last, I saw some of the birds that I most wanted to see: hornbills. Rhinoceros Hornbills were heard calling occasionally through the day and towards dusk I sat beside the road overlooking the valley in the hope of sighting some of the birds. At around 6.45 a pair of Rhinoceros Hornbills sailed up into an emergent tree in front of me, then crossed into another tall tree a little way off. The birds hopped up the trunk into the foliage for a few minutes before flying on again up the slope and out of sight. These magnificent birds, along with the other big hornbill species, are amongst the greatest treasures of the south east Asian rain forests and their presence, like that of the gibbons, often heard around Fraser's Hill, but seldom seen, are an indicator of undisturbed mature forest. This situation may not last long once the trans-hillstation highway is opened.

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National Moth Night

by Brian Goodey

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On 17th July 1999, 342 recorders lit up the night skies of Britain with a veritable battery of lamps and traps – 459 of them, placed at 303 sites up and down the country, operated by beginners and experts, alone or in groups of up to 100 strong. Over 40,000 moths were seen, and 13,776 records generated. 800 species were noted, about 30% of the British list. The first National Moth Night went as well as I could have hoped, given the lottery of the weather, and it seems destined to become a permanent fixture in the mothing calender.

The idea of a mass event such as this occurred to me one sticky night in 1987 at Fingringhoe Wick, a local nature reserve. Across the River Colne from where I was trapping, the blue glow of a mercury vapour lamp could be seen, twinkling occasionally as its operator eclipsed the beam in his or her pursuit of moths. Idly I speculated on our two catches, how similar they might be, and who else was taking advantage of the warm conditions. Three years later I was processing data sent by a local recorder I'd just met and one of his lists caught my eye. Sure enough, the site and date matched and I could at last make the comparison. With a user-unfriendly card index system to store records on, and a mountain of correspondence files to go through, extracting further lists for this night seemed rather pointless.

1996 saw the start of Essex Moth Group and an opportunity to use local recorders as a test to see whether a national event might work. And by now I was computerised! One night in each of the following three years was designated "County Moth Night", with the first on 13th July 1996. Twenty-five site lists were generated and 281 species duly noted. More importantly, the feedback from recorders was positive and encouraged further nights – nights that managed to escape inclement weather, despite being held in May and September.

By the end of 1998 it was clear that a larger event was feasible. By coincidence, Mark Tunmore (editor of *Atropos*) and Paul Hill of *InsectLine*, had also been looking at establishing a national event. Following a telephone call from Mark it was agreed that we would join forces to implement the huge amount of work involved in establishing, publicising and dealing with the data generated by the first UK National Moth Night. This involved advertising the event through magazines, newspapers, radio and television as well as contacting County



Recorders and local moth groups, leaving me the relatively straightforward job of collating any data generated on the night and writing the report.

By now time was getting short, and we still had the precise mechanics of the event to work out. We chose 17th July because it was at the height of the season and would be moon-free. Prizes, including a moth-trap, were offered in various categories to add a fun element to the event, and a premium rate telephone number was set up to promote public events around the country, the funds from which were to be donated to moth conservation projects. As the night approached, we scanned long distant weather forecasts, which initially were full of promise. A week to go and things began to deteriorate somewhat. It would be reasonable in East Anglia and the Midlands, but cooler conditions would affect the south and wind and rain threatened the north. In view of this, Mark and I considered that 100 replies would be good for a first attempt, and anything less would mean a rethink was needed.

On the night itself I was determined to do well, but unforeseen work requirements meant that I had to stay in the back garden, close to the phone! Conditions were ideal for the smaller moths and I had a very busy dusk session, soon taking the first Essex example of *Phyllocnistis xenia*. With the computer on I was able to input records as they happened, but by the early hours I was totally exhausted and left the trap to itself. Meanwhile, Mark and Paul held public moth-trapping events in Norfolk and Cheshire respectively.

On Monday morning a few very early results began to trickle in, but the postman soon began to wear a puzzled expression. By Friday we had passed the seventy sites mark but, curiously, letters had begun to subside. I was away for the following two weeks and wondered whether we had failed to achieve our 100 site target. But when I returned, the hallway was awash with envelopes of all shapes and sizes, and it was time to start work!

Inevitably, the lists contained some dubious records and part of our remit was to pass on all records to the various County Recorders and seek as much validation as possible. I considered their cooperation and local knowledge vital, and was soon able to remove a few oddities as well as pass on the names of new contacts.

This year we've chosen 23th September, a late date but one that will permit an early start and allow more children to join in at organised events (and hopefully spark an interest in insect recording), there being



many attractive autumnal species on the wing at this time. In 2001, following a suggestion by Paul Waring, August has been pencilled in to give a themed night in search of the White-spotted Pinion, *Cosmia diffinis*, for those that wish to. The great thing about the event is that it can be different things to different people and encourages recorders to make a special effort on the night – a chance to explore somewhere different, look for a scarce species, hold a public event, try different recording techniques or record precisely what is found in the garden.

Although primarily a fun event and a way of highlighting the profile of insect recording, we hope it has educational value and a capacity for gathering scientific data of interest. A full report of National Moth Night 1999 can be found in *Atropos* 9, and money raised by the National Moth Night Information Line will be donated to a project aiding the conservation of the Marsh Mallow Moth on Romney Marsh (subject to agreement from the landowner). If you would like to take part in this year's event, full details can be found in the January 1999 issue of *Atropos* or by sending a SAE to National Moth Night, 1 Clive Cottage, London Road, Allostock, Knutsford, Cheshire, WA16 9LT. Details, including organized events around the country, can also be heard by ringing the National Moth Night Information Line 09068 446 862 (calls cost 60p per minute and proceeds will be donated to moth conservation projects).

An update on the Chamomile shark caterpillars in Glasgow

by Frank McCann (6291)

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The Chamomile shark caterpillars I collected at Royston, Glasgow at the end of June 1999 were released into my garden amongst chamomile plants. I didn't see any sign of them feeding until early on the morning of 8th July. There had been some heavy rain, and when I saw the caterpillar, which was around one and a half to two inches long, rain was falling, but not heavily.



Some interesting reading, entomological and otherwise

by Brian O.C. Gardiner (225)

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I read with both interest and amusement the article by Harry Eales in the August *Bulletin*. Collecting in the Fens of East Anglia can have the same interesting consequences as he had! I think nearly all of us will have enjoyed P.B.M. Allan's moth books at one time or another and I still find them worth re-reading from time to time and have also used them as a source of information on various subjects. They are by far the commonest of his books but if you can get hold of them I can heartily recommend two others from his pen. These are *Trout heresy*, published by Philip Allan in 1936 and *The book-hunter at home*, also published by Philip Allan in 1920 and which has several editions including one published in America by G.P. Putnam's Sons in 1920.

Allan was a prolific author, often writing under a pseudonym. These include *The golden ladies of Pampeluna* by Francis Cabochon; *The delectable story of Princess Pirlipatine and the nutcracker* by O. Elephas Keat; *The prison-breakers* by Alban N. Phillip. Even though this last was reprinted in America in 1971 all these books are difficult to come by, although as entomologists we may not be looking in the correct section of the bookshops! Why not try looking for them on the internet with its 11 million books on offer at www.clique.co.uk/abe.htm

There are a number of other books, just as interesting as those of Allan. At least to my mind they are, even though the subject matter is entirely different. G.B. Longstaff's *Butterfly hunting in many lands* for instance is a delightful book as are any of those by Margaret Fountaine (*Love among the butterflies*) and Evelyn Cheeseman (*Everyday doings of insects*; *The great little insect*), not to mention *Slouch bat* and *The insect legion* by Malcolm Burr. For those who enjoy poetry there is *The beatific babblings of buglands bard* by Ellnest Eriott and Maude Clorley. I quote, "How doth the little F.E.S./Improve each hour bright!/He catches beetles all the day/and sets them half the night." Patrick Matthew's anthology *The pursuit of moths and butterflies* is well worth dipping into while the two books by James Birdsall *Moths in the memory* and *The boys and the butterflies* are entertaining accounts of a childhood spent entomologising. Other books which are well worth a read are *Butterflies on my mind* by Dulcie Gray and *Butterfly cooing like a dove* by Miriam Rothschild. From Canada has come that delightful



book, many times reprinted and therefore perhaps the easiest of those mentioned above to come by, *Moths of the limberlost* by Gene Stratton-Porter, whose other books, particularly *The music of the wild* for instance, should not be overlooked for a good and fascinating read. No doubt some other members will have their own ideas as to books that are an interesting entomological read.

A rare Staffordshire pyralid moth

by Jan Koryszko (6089)

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On the evening of 24th July 1999, Derek and Richard Heath were sugaring at Derek's house at the Meir, Stoke-on-Trent. After coming in from the garden they noticed a small moth flying around the lounge light. The moth was captured and brought to me for identification a few days later. I could see the moth was the Meal moth (*Pyralis farrinalis* (Linn.)). This species has been known occasionally to have come to light and sugar, and may have come from outside. Derek stores large quantities of wild bird seed, grain and cereal in his house for his birds, so this moth may have been introduced with the seed. The larvae live in a tough silken gallery interwoven with cereal debris and attached to a solid substratum, for up to two years – it feeds on stored grain. Derek tells me he has seen another moth in his house a few weeks later, so his bird seed may be the source of this species being present.

There are very few Staffordshire records of this moth. In the late R.G. Warren's book *The smaller moths of Staffordshire*, the moth was said to be common in stables during Victorian times, but it is now scarce. The only record since the Victorian era was at Dosthill Quarry on the Staffordshire/Warwickshire border in 1981 (P.B. Darch). The moth found in Derek's house was given to the Potteries Museum and Art Gallery, Stoke-on-Trent for their Lepidoptera collection and Biological Recording Scheme Centre.

I would like to thank Mr Keith Bloor, keeper of Natural History and Mr Don Steward for showing great interest.



Bamboo rafting and butterflies in the Matong Valley, Northern Thailand

by Matthew Rowlings (9108)

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I consider myself lucky to have been able to spend the summer of 1993 in the Far East with two college friends, including one fellow naturalist, Simon. We confined our travels to Thailand and West Malaysia to cut down on travelling and as this was my first adventure in the tropics/sub-tropics (outside Europe, in fact) I had a totally new and exciting butterflying experience. The highlight of our holiday occurred over two days in the mountains of northern Thailand – the Matong Valley.

The route to our two-day excursion began in Thailand's second city Chiang Mai. Here we booked a three-day mountain trek. During the trek we got on so well with the guide, call Porn, that he offered to take us bamboo rafting with a friend, free of charge. We were keen, so next morning we hired two 100cc Honda mopeds to make the journey.

We followed Porn on his larger bike for one hour along the main highway before we turned onto a dirt road. The road was very bumpy and as we passed villages and hamlets it got narrower and narrower. After 25km we went into a narrow valley with forested hills and a small stream. I stopped several times to look at butterflies and, in doing so, lost my friends.

The road forded a stream at one point and coming out of the other side of it I put up a cloud of small skipper-like swallowtails (*Lamproptera meges*). Their forewings measured 20mm from wing root to wing tip, with over half of the wing area transparent; the hindwings were of similar size but they sported amazing tails 35mm long. These distinctive swallowtails have a very fast wing beat which, combined with the electric blue-green streaks on their black wings give a remarkable strobe-like flashing effect – quite enough to confuse my eyes and presumably those of predators too. It struck me that they looked like large solitary wasps with their long tails pointing behind them resembling the long legs of some wasps. Their transparent wings are somewhat Hymenopteran. Later I found these swallowtails, quite easily, settled on mud or low vegetation near running water or around large puddles.

A little further on I skidded to a halt in front of some dog excreta in the road – on it were two huge danaids with a blue sheen on their brown upper forewings and numerous white spots. I was unable to catch either specimen so unfortunately their identity will remain unknown.



At the "Pub at the End of the Universe" 36km from the main road I found my companions tucking into some food. Just across the road was an army truck and about four young paramilitary policemen with very large automatic rifles. I'd seen a few others at the roadside earlier. They'd been deployed after three groups of tourists had been attacked by armed bandits, but Porn assured us that since the police had arrived there had been no hint of trouble. We believed him – and anyway the sun was making a rare appearance in the middle of the wet season.

We were now in the Matong Valley and the lively river was three times its dry season height. We were shown to our host's guesthouse. Unfortunately Porn had had some business turn up that he had to attend to so he had to return to Chiang Mai almost immediately and would be unable to go rafting the next day. His friend, Meaw, was away for a few hours so Porn introduced us to his parents. They didn't speak (or move!) much, so we were effectively on our own for three hours.

The valley was small with steep heavily wooded sides and the jungle looked almost untouched. Simon and I decided to walk further along the dirt track to do some hunting and were both impressed with the species on offer, many of which were not to be found in my books on West Malaysian species – not surprising since that territory is 1500km to the south of Matong.

The Blues were well represented but most are yet to be identified with Bernard d'Abrera's *Butterflies of the World* series. Amongst these was a stunning *Heliophorus* species with dark blue upperwings and beige underwings which had an intense red border. A single *Discolampa ethion* was seen flying, with other blues, very low to the ground around a puddle. It had a broad white band across both forewings surrounded by a light dusting of blue scales with the same iridescence as the male Adonis blue (*Lysandra bellargus*).

We came across a group of five huge stag beetles clinging onto the stems of a reed-like plant. Their bodies measured 37mm in length and were 25mm in diameter. Their ugly mandibles were no less than 50mm long. They were also devilishly hard to pull off fingers and clothes once they got a hold.

It was while I was showing Simon these beetles that I spotted another giant, under a particular sapling leaf was another leaf – but the second leaf had no stalk; a change of angle revealed an enormous 75mm wingspanned skipper. I made no mistake catching this monster and took off about a foot of the sapling. In captivity it deposited numerous large black pear-shaped scales in its plastic container, but I



could not tell where they were coming from so I will have a closer look when it comes off the setting board. It as yet has no name.

The activity of hiding under leaves with parallel wings was not new to me as I'd seen it in a few other butterfly species, particularly in sunnier Malaysia (during the hot season). It seems to be a good way of escaping the direct heat of the sun and avoiding the view of potential predators.

After two hours and several interesting birdwings, swallowtails, browns and nymphalids the sun went behind the mountains so we walked back to the guesthouse to await the return of our host. He arrived at 18.30hrs just before dark. He spoke good English but his wife spoke none. We settled down for some food which consisted of freshly picked bamboo shoots that were excellent. We talked for nearly four hours being warmly accepted by Meaw and his wife. After a little (too much!) Mekong valley whiskey we went to our blankets and slept well on the bamboo floor of our hut.

The next day we started out at 9.00hrs, an hour later than planned, on our two-hour walk to see the rafting man. Simon had the dubious honour of carrying Meaw's revolver in his backpack. Meaw had proudly shown us his bullets that "go in small and come out big" – the illegal dum-dum bullet! There were no clouds in the sky but the sun had not risen enough to shine on our route in the valley. However, things were beginning to move in the warmth, a stunning "white" was often seen flapping along the road. It was a species of Julia (*Delias pasitoe*), which is mainly charcoal brown/black with bright yellow hindwings and scarlet wing roots. I saw it only once flying in direct sunlight.

The valley began to open out into a plain and the full force of the sun could be felt on our skin. We began to see some of the twenty or thirty species of Gliders (or Sailors) in the area, but only two species were caught because the pace of the walk was (as usual with a guide) far too fast for serious study and collection. One was *Neptis hylas* – a very common species across Thailand and Malaysia and not at all unlike the European Hungarian glider (*Neptis sappho*). In some of the species orange replaces white on the upperwings. The second one caught was *Pantoporia bordonina*: one of the orange types. In addition two male Giant egg butterflies (*Hypolimnas bolina*), a large Nymphalid, were found flying around flowers planted outside a house in the middle of a field. Its curious English name presumably refers to the white centred blue fried egg markings on each upper wing. Flowering plants were not often encountered and this species was the only one I strongly associated with flowers.



We crossed an area of cultivated ground that was comparatively poor for butterflies. However, there were some large strange bat-like birds circling overhead which Simon identified as Rufous winged buzzards. Meanwhile a working elephant and its mahout passed by.

We entered a village where we sat in some welcome shade for fifteen minutes. I was frustrated (and mildly embarrassed) by a large Chestnut skipper with veins highlighted in orange which successfully evaded every effort to catch it, much to the amusement of the locals. Already I had nearly run out of butterfly boxes and was faced with the fact that I was going to have to kill them if I was ever going to identify them – something I have never relished doing.

The route to the river (not seen or heard since our departure in the morning) took us off the dirt track and across two hills, the climbs were hard in the blazing sun and the humidity was high. We entered the jungle which was quite open with plenty of light at ground level and not the impenetrable undergrowth usually encountered. I immediately found *Drupadia ravindra*, a spectacular copper that is often found in open jungle areas. On its underside it has copper forewings and black and white tiger striped hindwings. In contrast its upperwings are dark blue and brown. The three tails make this a true exotic.

Further on I caught my first “leaf butterfly”, that is, a butterfly that usually resembles a dead leaf both in shape and colour. It was a Nymphalid, but has yet to be identified. Butterflies that fall into this group come from several families but they are all very hard to get close to. They are often seen flying deep in dark forests hiding and resting inside clumps of bushes well protected by twigs and branches from any movement of the net. From their dark hiding places they can easily detect movement in the open – including approaching lepidopterists – so when disturbed they will always fly out of the bush on the opposite side to the pursuer and escape. The one I managed to catch made the mistake of flying all the way round from the back of the bush and into my net.

Meanwhile, Meaw had decided to investigate an orchid at the top of a tree and bring us back its flower. This provided me with a welcome break from the fast pace we had been walking at, so now I could concentrate on some real hunting. It was easier just to stand still and watch as things approached and passed by. I caught the remarkable *Spindasis syama* – a blue with tiger stripes centred with reflective green/blue scales on the cream underside and large tails with bright orange roots. Huge blue/black *Papilio memnon* swallowtails flew past with forewings measuring 70mm each, almost a 150mm wingspan. I caught several European-like blues, a few browns, a very reflective



Metal mark and a *Euthalia dirtea* (I think its English name is The archduke). The latter is a large dark brown nymphalid with bright iridescent blue/green borders to the forewings. All too soon Meaw came down from the tree but without a flower, so we pushed on to the river leaving Simon lagging far behind watching several Asian paradise flycatchers with their ridiculously long tails.

At last we arrived at the rafting departure point. The narrow strip of sun drenched land beside the river was buzzing with butterflies and dragonflies; there were at least fifteen unfamiliar species of butterfly swamping the senses so I was now having to over-fill the already full boxes. I had to resort to putting butterflies in the sun and pinching their thoraxes to kill them and so enable me to refill the boxes. The ten minute price negotiation for the raft went extremely fast. Unknown species were flapping, gliding or rushing past all the time but I could do nothing about it. Those I did catch included the very fast and restless swallowtail-like nymphalid *Polura athamas* (caught at last!), a single orange Charaxes species, a large glider with bright red spots on the forewing, a large-bodied blue with a metallic underside, and a 50mm wingspanned blue of the *Arhopala* genus. Also seen at the river but in greater numbers were the Great orange-tip (*Hebomoia glaucippe*) – a dramatic orange-tip with a 110mm wingspan, the Bluebottle (*Graphium sarpedon*) – a swallowtail with a glossy blue/green band across both wings, and the peculiar *Parthenos sylvia* which is a large nymphalid that usually flies quite high around trees at the side of water. They have transparent wing areas through which the sky can be seen as they glide around. Their gliding is quite odd, they hold each wing open about twenty degrees more than flat, that is 110 degrees from the vertical over the body. This habit renders them very easy to identify.

The swift river took us the 10km back to base in forty-five minutes. The jungle was lush and appeared undisturbed with some very ancient trees present. Unfortunately we hit a submerged rock in some rapids and became lodged onto it with a thirty degree list. The bags and boots previously suspended above the raft were dangling in the water. With camera and collected butterflies in danger it seemed like ages before we were released by our heroic driver. Unbelievably nothing delicate got wet.

When we arrived back at the guesthouse we had two hours before we had to head back to Chiang Mai. Meaw's wife got hold of my net and was catching butterflies at the river faster than I could identify them. She brought back a magnificently powerful shiny white *Polyura* species (Nymphalidae) and the gorgeous Paris swallowtail (*Papilio paris*) which is black and covered with a dusting of staggeringly



beautiful reflective green scales with its hindwings endowed with a dazzling blue/green blotch that flashes during flight.

There was a urine dampened patch of mud at the water's edge that was host to numerous yellow *Catopsilia pomona* and three birdwings; none of which could be secured for identification. At least two species of the dark-brown Danaiids called Crows flew past (of the genus *Euploea*), but these also evaded capture.

Finally we had to leave, settling up with Meaw, we paid him well, for driving us on the raft and we treated our initial contact Porn to a highly-prized bottle of Scotch for his help.

The number of species so far identified is thirty-two and with another twenty-five on the setting boards puts the total at over fifty. Not unusual for the Far East, almost half of the species were seen nowhere else on my travels, so it pays to keep moving about and to keep your eyes open.

Favourite haunts

by Jan Koryszko (6089)

3 Dudley Place, Meir, Stoke on Trent, Staffordshire ST3 7AY.

On the morning of the 10th August 1998, whilst at work I noticed a Common wainscot (*Mythimna pallens* L.) roosting at the base of an old back door frame. At around 7.30pm the same evening when I finished work, I noticed the moth had gone. The following morning when I returned to work the moth was back again in the same spot. This went on for ten days. I finally found the moth dead at the same spot. No doubt this must have been its favourite roosting spot.

Willow beauty moth in Glasgow

by Frank McCann (6291)

3 Langbar Path, Easterhouse, Glasgow G33 4HY.

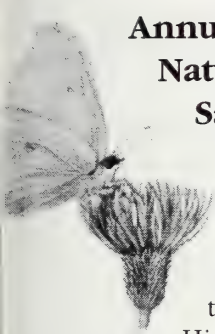
During the third week of August I found on a lace curtain on my window a female Willow beauty moth. I kept it for quite a while in a glass container, and it laid about twenty eggs on *Cotoneaster* and ivy which I had taken from my garden. I will see if the caterpillars hatch out. They feed on various trees and shrubs such as hawthorn, birch, privet, lilac and various others, including ivy.



Annual General Meeting and Members' Day Natural History Museum Saturday 15th April 2000

by Wayne Jarvis (9899)

e-mail: wayne@theaes.org



A wet and generally unpleasant day greeted the Society's Annual General Meeting and Members' Day this year, which was once again held in the Natural History Museum. Despite the weather there were 68 members in attendance, one of the better turn outs in recent years, and they were treated to a day of various talks and tours.

The Members' Day saw talks on the British Orthoptera by Peter Sutton, the Society's Habitat Conservation Officer, Animals of South Africa by Paul Brock and stepping in at very late notice due to an illness, Peter Sutton gave a second talk on the Invertebrates of Devon. All three talks were well received and stimulated some interesting discussion.

Along with the talks, the Society had organised a behind the scenes tour of the Entomology Department's library. This involved a short but very interesting chat about some of the rare books and manuscripts that the library holds. Items such as Frohawk's original plates were on display, and many members found the tour a real eye opener to what the museum holds. Many thanks must go to Julie Harvey, the Entomology librarian for her help in setting this visit up for us and to Vicki Veness for giving up her Saturday to show the groups around.

The planned tour and Bug Hunt of the Museum's Wildlife Garden unfortunately had to be abandoned due to the adverse weather conditions.

For our younger members, a Bug Club activities room was provided. Bug Clubbers were working busily making plasticine insects, stick insects out of plaster of paris, felt bugs, colouring and a variety of competitions to enhance their entomological knowledge. The group seemed to enjoy the day's events and all went away with a prize of some sort or other. Thanks must go to Susan Holford, Lorna Jarvis and Angela Sexton for their hard work during the day.

The Society also had a stand in the main gallery for visitors to the museum to look at some invertebrates and learn about the Society. As always, this went down well and the stand was crowded with people



from when the museum opened until the doors closed. Thanks again go to Philip Crisp (and his Dad!), Zoe Masters, Kieren Pitts and Nick Sexton for manning the stall during the day.

Overall, the day went very well and all those attended seemed to have an enjoyable day and we look forward to what next year's event may bring.

• Wanted •

We are still in desperate need of new Council members. All we need is people who are prepared to do some small jobs for the Society and attend most of the Council meetings, held every three months in the vicinity of London on a Friday evening. You simply do as much or as little as you can! If you feel that you may be interested, please contact the Secretary who will be very pleased to tell you more about the role of a Council member!!!

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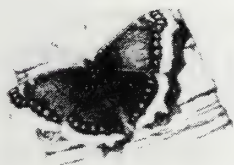
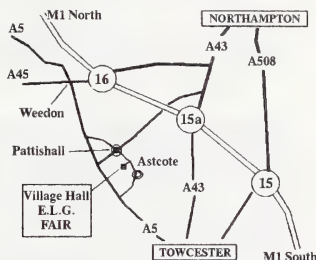
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THE PHASMID STUDY GROUP



Treasurer/Membership Secretary

Paul Brock. "Papillon", 40 Thorndike Road, Slough, Berks SL2 1SR. England.

Since its formation early in 1980, The Phasmid Study Group has expanded to more than 500 members in 20 countries, including people of all ages and ranging from beginners to professional entomologists. The purpose of the group is to encourage studies of all aspects of PHASMIDS (Stick & Leaf Insects). Since phasmids have received little attention until recently, there is scope for anyone to provide new information.

NEWSLETTER – The newsletter is issued quarterly and contains news items, livestock information, details of exhibitions and meetings, and a variety of short articles on all aspects of phasmids.

PHASMID STUDIES – This is issued biannually, in June and December. It contains longer articles on all aspects of phasmids, with an emphasis on natural history, captive breeding and behavioural studies. Abstracts and occasionally reprints from other publications may also be included.

LIVESTOCK DISTRIBUTION – There are now about 100 species of phasmids being kept by members, and new ones are continually being added - many of the Group's species are not available commercially. The Livestock Co-ordinator and Supplier's Panel help to distribute surplus stock to members who want them. Members are not permitted to sell any livestock they obtain through the group.

MEETINGS – Every year at least two meetings are held, usually at the Natural History Museum in London. Here members can talk with fellow enthusiasts and give and receive livestock. The Group also provides displays at several entomological exhibitions.

NEW MEMBERS – A list of members and a species list are sent out on joining, together with Newsletters and Phasmid Studies already issued in that year. To ease administration, membership information is stored on computer and is subject to the restriction of the Data Protection Act.



MEMBERSHIP APPLICATION FORM. The subscription for the year 1999 is £5.00 (U.K.), £6.50 (Europe) and £7.50 (Overseas). Please make your remittance payable to **The Phasmid Study Group** and send it to the Membership Secretary (address above). Non-UK payments must be by sterling cheque drawn on a UK Bank, or Eurocheque in sterling.

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The Bulletin

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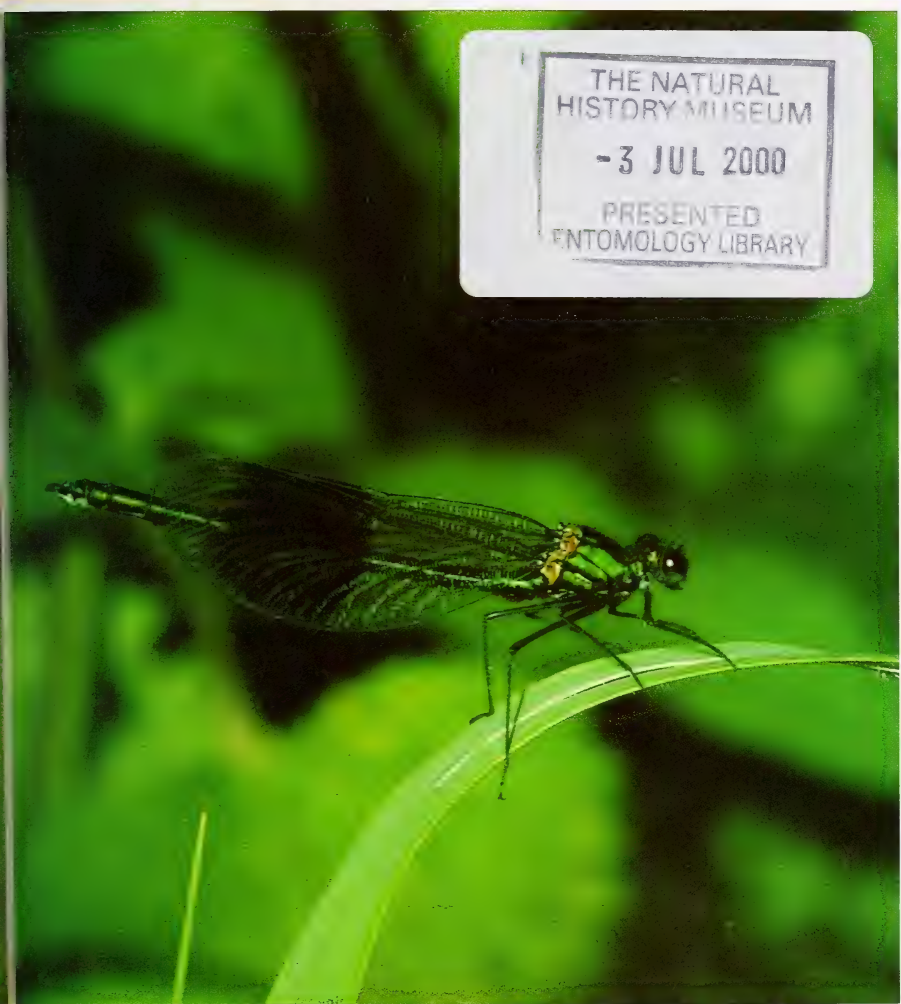
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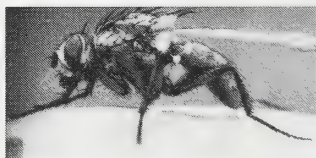
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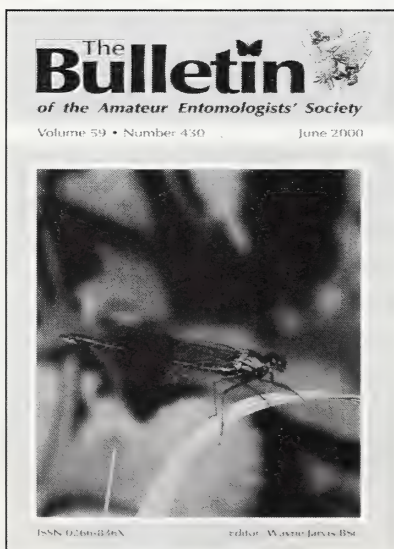


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The cover of the *Bulletin* features the Banded Demoiselle, *Calopteryx splendens* G.

This species of damselfly may be found around slow-flowing rivers and streams, with muddy bottoms, south of a line between Blackpool and The Wash, though less so in the south west. It prefers the banks to be open, and for there to be adjoining meadows. For egg-laying it needs healthy plants, that emerge above the water surface. Therefore, it tends to be very sensitive to pollution. Larval development takes about 24 months, so includes two winters. The adults may be seen flying during mid to late May until early to mid September. It is common and widespread throughout Europe and Asia. It is also found in Ireland.

Photo: Nick Holford.

The
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of the Amateur Entomologists' Society

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June 2000

Editorial

After the request for help in the April issue of the *Bulletin* I was optimistic that I may have a few people reply. However, the eventual response was one! I really cannot stress enough, that at present the Society needs more hands to help with the administration side of things if the Society is to continue to function. We are a voluntary organisation, and at present there are a few people that are keeping the Society running. Please think on this and if you are able to lend a hand in any capacity, please get in touch with me.

In this months *Bulletin* we have enclosed a new information/membership form for the AES, please pass this, or a copy, on to anyone who may be interested in joining the Society. We would particularly draw your attention to the Bug Club which has its own magazine and is run for junior members under 13. In addition if you can help our membership drive by keeping a local Museum or Butterfly Farm stocked with copies of this leaflet, please telephone the Hon. Treasurer on 01206 392502.

The exhibition is fast approaching once again and we shall be staging an exhibition that is even larger than last year. Based on two floors at Kempton Park Racecourse, the event on Saturday 7th October must rank as one of the largest exhibitions of its type in the world. If you are interested in booking tables for this years event, please complete and return the enclosed booking form as soon as possible.

Finally, the *Butterflies of Cyprus* booklet which was sent to all members free of charge in April is now available for purchase from AES publications priced £3.60. Eddie John is still looking to further the records that he has from the area and these are outlined overleaf.

Enjoy the summer sun (providing we get some!)

Wayne





Butterflies of Cyprus – Records please!

by Eddie John (7937)

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The April 2000 issue of the Bulletin was accompanied by Pamphlet No. 15, entitled *Butterflies of Cyprus*, which reported on a year's butterfly sightings on the island. This complemented an earlier paper by Rob Parker, full details of which are given on page 16 of the Pamphlet.

The Distribution Maps for each of the species also included records of sightings received from visitors to, and residents on Cyprus up to March 2000. Several useful sets of current records have also been received since publication. Rob Parker and I will continue to maintain the maps with a view to producing a further update in the years ahead and would welcome details of sightings, past, present or future, from any experienced recorders.

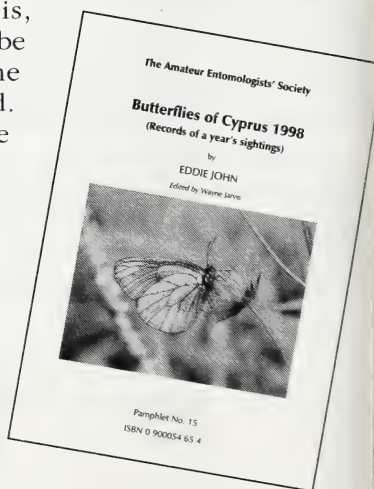


We shall be pleased to provide as much assistance as necessary in order to simplify the recording system, so anyone wishing to help is most welcome to contact either Rob Parker or me, for further information. Rob's address is 66 Cornfield

Road, Bury St Edmunds, Suffolk IP33 3BN (e-mail: robparker@waitrose.com). As my wife and I now plan to move to South Wales sometime this year it is, perhaps, advisable for postal records to be directed to Rob, whereas either of the e-mail addresses may be used. Alternatively, my postal address can be confirmed in advance by e-mail.

We look forward to receiving further records and promise to acknowledge all recorders in any future update.

(Further copies of *Butterflies of Cyprus* are available from the AES at £3.60 per copy, inclusive of postage from AES Publications).





Observations on the parasitoid *Eulophus ramicornis* Fabricius (= *Eulophus larvarum* auct.) (Hymenoptera: Chalcidoidea: Eulophidae)

by Hewett A. Ellis (1994)

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Introduction

Eulophus ramicornis is a small chalcidoid wasp whose larvae feed as gregarious ectoparasitoids on several different species of macrolepidoptera caterpillars. Although a relatively common parasitoid it is of particular interest on account of its fascinating biology which, *inter alia*, includes seasonal polymorphism of both pupae and adults and the formation of so-called 'tomb-stone' pupae.

The species described here is currently known as *Eulophus ramicornis* Fabricius, but this has not always been so. Thus in standard reference publications such as *Handbooks for the Identification of British Insects* (Askew, 1968) and in the literature generally up to the end of the 1980s (Gradwell, 1957, 1958; Shaw, 1981, 1987; Godfray & Shaw, 1987) the species was referred to as *Eulophus larvarum* L. Then in 1988 Graham published an account of part of the Nees von Esenbeck Collection of Hymenoptera which he had discovered during 1951 in the Hope-Westwood Collection of European Hymenoptera in the Hope Department of Entomology, University Museum, Oxford. This paper made fascinating reading to rival any good detective story, but our interest is in a species in the collection named *Eulophus dimidiatus* Nees, 1834, which Graham tells us is the same as the species then known as *Eulophus larvarum* L. However, Graham also discovered that the type specimens of *E. larvarum* in the DeGeer Collection in Stockholm are misnamed and are in fact of a rarer species that had been known as *Eulophus aeneicoxa* Thomson, 1878. This last-named species is now therefore known as *E. larvarum* and the relatively common species *E. larvarum* auct. (of various authors) up to 1988 has to be known by the next available synonym, which according to Graham (1988) appears to be *Eulophus ramicornis*, Fabricius, 1781.

The purpose of the present paper is to describe the life-cycle of *E. ramicornis* based on personal observations made over the period 1998-99 and to consider these in relation to accounts of the biology of the species in the literature.



Parasitised caterpillar

On 13th September 1998 I found a caterpillar of the Coxcomb prominent moth *Ptilodon capucina* L. attached to an oak leaf in a small plantation of young Oak trees growing on the site of an old pit at the Rising Sun Country Park, Wallsend (NZ 297686). It bore the characteristic pair of red-tipped tubercles on the dorsum of the eighth abdominal segment and on superficial examination at the time of collection appeared to be normal.

The caterpillar should have gone on to pupate and overwinter as a pupa. However, it remained motionless, unless disturbed, and did not feed. The following day (14th September) close inspection revealed the presence of twenty-two tiny bright green ectoparasitoid larvae attached and feeding immediately below the spiracular line, particularly towards the rear of the caterpillar. (Plate 00I, Fig.1) which, by the 18th September, had become detached from the leaf leaving a "ring" of mature larvae still attached. The parasitoid larvae were now plump and pale yellowish-green (Plate 00J).

During the period of feeding and growth the larvae did not appear to excrete. By the 19th September each larvae had rapidly excreted a mushroom-shaped pillar of tiny ovoid faecal pellets. Each pillar was narrowest at its base where attached to the leaf surface by only one or two pellets and its width increased with increasing height with the addition of more pellets. The whole brood now made a striking formation - the 'ring' of larvae each with its narrower head end directed inwards and its own discrete faecal pillar on the outer side (Plate 00K). On the 20th September the larvae darkened, became black, and appeared shrunken reminiscent of tiny dried prunes, but remained attached by their dorsal surfaces to the leaf in a 'ring' formation (Plate 00L). Examination with a stereomicroscope revealed the outline of the adult insect structures such as those of the head and legs. There was no attempt at cocoon formation. This arrangement of pupae has given rise to the term 'tombstone pupae' (Askew, 1968).

At this time reference to published accounts of Hymenopteran parasitoids (Gauld & Bolton, 1996) led me to suspect that the parasitoid probably belonged to the chalcid family, genus *Eulophus*, possibly *E. larvarum* which was known to be a common parasitoid which attacked a number of different species of caterpillars (Shaw & Askew, 1976). At the time I was unaware of the change in nomenclature.



Fate of the parasitoid pupae

The pupae, still attached to the oak leaf were kept in a small plastic container to overwinter in a cold garage. They were brought indoors to an unheated room at the beginning of March 1999 to facilitate daily inspection. The adult parasitoids commenced emerging on 5th April 1999 (seven throughout the day) and the remainder rapidly followed over the next few days (a further five on 6th April and six on 7th April) and all twenty-two had appeared by 8th April. Each adult emerged at the anterior end of its pupa which spilt locally dorsally and ventrally. Many of the empty pupal cases remained attached to the oak leaf, but some were now detached.

The adult parasitoids

The tiny adult Hymenopteran parasitoids measured about 3mm in length (including the head) and the wing span was 6 to 6.5mm. The forewing venation was simple with a single line comprising submarginal and marginal veins bifurcating distally into a stigmal and poststigmal vein, the latter being longer than the stigmal vein. The head and thorax were metallic green and the eyes dark brown. The antennae were "elbowed" in the manner characteristic of chalcid wasps and there were three funicle segments terminating in a club. None of the individuals had branched funicle segments indicating they were all females. (Males have branched antennae; see drawings in Gradwell, 1957 and Askew, 1968). The gaster (ie. the second and subsequent abdominal segments) was dark brown, but there were pale buff areas near its base on the dorsal and ventral surfaces. All the leg segments were pale cream-coloured with the exception of the distal part of the third femur which was marked with brown on the medial and lateral aspects.

The entire set of specimens was sent to Dr Mark Shaw for expert determination. Dr Shaw reported this was a unisexual (all female) brood of *Eulophus ramicornis* Fabricius (= *E. larvarum* auct.).

My observations have been restricted to one brood of *E. ramicornis* affecting one host species and can give only an incomplete picture of the life-cycle. The following additional information has been gleaned from the literature and I am indebted to Dr Mark Shaw for drawing my attention to several relevant papers. Mention is made to those of my own observations which are at variance with the literature.

Hosts of E. ramicornis

E. ramicornis is but one of the six species of the chalcid genus *Eulophus* which are known to occur in Britain (Shaw, 1987). All are



gregarious ectoparasitoids of caterpillars. Most are rare or uncommon and *E. ramicornis* is the commonest and is polyphagic, attacking a wide range of macrolepidoptera. Thus Shaw (1987) lists nineteen different species of moth caterpillars which may serve as host and these are distributed throughout five different families – Thyatiridae, Geometridae, Notodontidae, Lymantriidae and Noctuidae. The present host species, *Ptilodon capucina* (Notodontidae) is amongst the commonest of host caterpillars for *E. ramicornis*.

It seems that *E. ramicornis* is very catholic in its choice of hosts. This does not mean that it is to be found widespread in different types of habitat for all the species of caterpillars attacked are strictly arboreal feeding on deciduous trees, particularly on Oak (*Quercus*) as in the present case, and Birch (*Betula*) (Shaw, 1987). Polyphagy avoids the inherent risks in being restricted to, and dependant upon, one host species and makes it easier for the parasitoid to synchronise its life-cycle with those of its hosts.

Host selection and life-cycle of parasitoid

The female parasitoid is very careful about choosing a suitable host for her brood. The caterpillar needs to be sufficiently large to be able to sustain the numerous parasitoid larvae until they have matured and are ready to pupate. In addition, as Shaw (1981) has shown, the female parasitoid only attacks the host caterpillar when it is about to undergo an ecdysis. She makes an exploratory insertion of the ovipositor apparently to confirm the suitable state of the caterpillar. The female remains on the caterpillar until its cuticle splits and retracts, when she inserts the ovipositor for a second time, through the newly-exposed soft cuticle. Following the completion of ecdysis the female parasitoid moves to and fro along the caterpillar whilst laying a series of ova below the line of the spiracles. Shaw (1981) has demonstrated that at the time of the second insertion of the ovipositor, the female injects a non-paralysing 'venom' which, by interfering with the host's normal endocrine regulatory mechanisms, induces a delayed depression of the caterpillar's feeding and prevents any further ecdysis. This explains the behaviour of the present Coxcomb prominent caterpillar.

The ectoparasitoid ova and newly hatched larvae are tiny and being situated low down in the folds of the host's cuticle are easily overlooked. The larvae feed up rapidly and the apparent sudden arrival of a cluster of parasitoid larvae on the outside of a caterpillar collected from the wild (as in the present case), may mislead one into thinking that they are emerging endoparasitoids (Shaw, 1987).



E. ramicornis is typically bivoltine but there may be a third generation (Godfray & Shaw, 1987). Adults emerging from overwintering pupae in the spring mate and the females oviposit on the chosen host caterpillars. The larvae develop rapidly and produce pupae from which adults emerge later in the summer. These in turn produce pupae which go on to overwinter, as in the present case. Occasionally some of the summer pupae emerge early and give rise to a third generation of adults in the same year.

Seasonal variations of pupae and adults

It has been known for many years (Gradwell, 1958) that both the pupae and adults display a seasonal polymorphism. The pupae found in the late summer/autumn, as in the present instance, are characteristically black and overwinter in the leaf litter. Although in captivity my pupae remained on the leaf overwinter, they may be loosely attached and in natural conditions become separated amongst the leaf litter. The adults which emerge from these black pupae in the following spring characteristically have a completely dark gaster. In contrast the pupae of the following generation, which emerge the same year, are firmly attached to the leaf surface, are light brown in colour and give rise to adults with a pale spot at the base of the gaster. These seasonal differences are so marked as to have led Gradwell (1957) to describe the two forms as two different species. He retained the then current name *E. larvarum* for those with pale pupae and a pale spotted gaster and described the form with the black pupae and an entirely black gaster as a new species *E. nigribasis*. Subsequent observations (Gradwell, 1958) of more material indicated that the so-called *E. nigribasis* Gradwell was in fact merely the overwintering form of *E. larvarum*, which as described above is now known as *E. ramicornis*.

My own experience has shown that this linkage between black overwintering pupae and adults with an entirely black gaster is not absolute. All my adult females derived from overwintering black pupae had pale marks on the ventral and dorsal aspects of the base of the gaster. In addition there were brown markings on the sides of the third femora. These features do not appear to have been mentioned previously in the literature. However, Dr Shaw (*pers. comm.*) has informed me that although the presence of the pale gaster spots and the femoral coloration is unusual, he has seen other overwintering broods exhibiting both these features.



Brood size and seasonal variations in sex ratio of adults

All twenty-two of the present brood emerged in the spring from overwintering black pupae. This is a good sized brood judging by the literature. Thus Godfray & Shaw (1987), in an analysis of a large series of spring and summer broods, found an average of 14.5 although individual brood size varied from one to 51. The high survival rate (100 percent) noticed in the present case seems fairly typical, Godfray & Shaw (1987) reporting that overall 70.4 percent of overwintering pupae produced adults and in many individual broods the survival was 100 percent.

All of the present twenty-two adults were females. At first this might be unexpected but it has been shown (Godfray & Shaw, 1987) that there is a seasonal variation in the reproductive strategy of *E. ramicornis* (= *E. larvarum*) in which the overwintering black pupae give rise to a remarkably large number of all male or all female broods in about equal numbers with very few mixed broods. In contrast, the subsequent generation of predominantly pale pupae produce only a very few all male or all female broods, the majority being mixed broods. In the light of this information it is not surprising that the present brood from overwintering dark pupae should have been single sexed (all females). Further consideration and explanation of *Eulophus* reproductive strategy is beyond the scope of this paper. Anyone interested should refer to the paper by Godfray & Shaw (1987).

Larval faecal pillars

During the few days whilst under observation the rapidly growing *E. ramicornis* parasitoid larvae did not produce any excrement. The striking "pillars" of faecal matter were produced rapidly just before pupation occurred. The ectoparasitoid larvae feed on a high protein fluid diet (the caterpillar's haemolymph), and this leaves very little indigestible matter for excretion. Initially the intestine of the parasitoid larva is not fully developed throughout its entire length and the matter accumulates in the blind-ended midgut. It is only when the hindgut forms by invagination of the body wall (proctodaem) and links up with the midgut that complete patency of the intestine is established. This occurs just before pupation and the larva is then able to excrete and form the faecal "pillar". This mechanism prevents contamination of the immediate environment during growth of the larvae and must be of particular value for those parasitoid species living in confined spaces, especially for endoparasitoids (Gauld & Bolton, 1996).



In the case of *E. ramicornis* it is difficult to understand what benefit results from the meticulous stacking of faecal pellets to form 'pillars' attached to the leaf surface. The phenomenon is presumably linked to that which occurs in other members of the Eulophidae family which parasitise caterpillars occurring in leaf mines. These parasitoid larvae pupate with a ring of faecal "pillars" which are thought to act like "pit-props" preventing collapse of the mine as the leaf dries out (Gauld & Bolton, 1996).

Summary

A caterpillar of the Coxcomb prominent moth attached to an oak leaf collected in September 1998 at the Rising Sun Country Park, Wallsend was found to host twenty-two ectoparasitoid larvae. These fed and matured rapidly over a few days. The larvae were then arranged in a ring on the leaf and immediately prior to pupation each produced a "pillar" of faecal pellets. The so-called "tombstone" pupae were black and after overwintering produced a unisexual brood of female *Eulophus ramicornis* Fabricius. This chalcidoid wasp was formerly known as *E. larvarum* L. It is a relatively common parasitoid having a wide range of host lepidopterous caterpillars which feed on broad-leaved deciduous trees. It is generally bivoltine and there are characteristic seasonal differences in the colour of the pupae and markings of adults which have been described in the literature. The present specimens show that these seasonal differences in the adult are not invariable.

Acknowledgement

Once again it is a pleasure to thank Dr Mark Shaw, Royal Museum of Scotland, Edinburgh for his encouragement and his help with the relevant literature, and for the determination of the parasitoid.

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Foodplants for the Elephant hawk-moth

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Over the past few years I have grown a number of species of fuchsia in my garden – there are hundreds of different varieties. I have a lot of cuttings from friends which have grown very well in my garden. One of my neighbours has grown a hedge of two different species of fuchsia, one on each side of his garden, they are around five feet high. Nearly every year he calls me round to show me larvae of the Large elephant hawk-moth *Deilephila elphenor* Linnaeus, but they occupy only one of his garden fuchsia hedges, the other is ignored. I have never found any Large elephant hawk-moth larvae on my many varieties of fuchsia in my garden, only finding them on the odd occasion on rose bushes. I have since grown the same species of fuchsia from cuttings from my neighbour and have had the same results. I cannot name this fuchsia variety but it is very hardy and fast growing; it is sometimes found on waste ground, no doubt garden escapees. The usual foodplants are willowherb, bedstraw and bindweed. The larvae are often found but on 8th August 1992 at Hopton Heath, Staffordshire, whilst on a field club trip, the late R.G. Warren, former Lepidoptera recorder for Staffordshire, recorded Elephant hawk-moth larvae feeding on Himalayan balsam *Impatiens glandulifera*, a hitherto unrecorded foodplant in Staffordshire, although P.B.M. Allan, in his book *Larval foodplants* (1949) gives wild balsam and garden spp. of *Impatiens balsam* as a foodplant, along with a list of other foodplants in the wild and in confinement, which the Elephant hawk-moth larvae will feed on – no doubt this list can be added to after all these years with a number of new foodplants recorded.



The virtues of spindle

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The spindle tree, *Euonymus europaeus*, is one of the most attractive shrubs of the British countryside, especially in autumn when it has its pink and orange berries and the leaves start to colour.

The wild species and a number of cultivars have long been grown in gardens as have various exotic members of the genus, including the evergreen hedging spindle, *Euonymus japonicus*, which does not really look like a spindle at all unless you see it in fruit.

Our wild spindle has surprisingly few invertebrates associated with it, which makes those one can find doubly interesting. Last summer I was using a beating tray in our garden while studying the insect associations of another plant and, on occasions, I investigated our mature spindle trees. I was nearly always rewarded with a caterpillar of two of the Scorched carpet moth, *Ligdia adustata*. These looper larvae (Plate 00M) are astonishingly well camouflaged. Their green is identical with the young green twigs of the spindle and head and warty prominences on the body are just like the small buds and corky lenticels of the plant.

Another rather scarce moth found in our area is the Pyralid, *Nephoterix angustella*. This, as the specific name suggests, has very narrow wings. The caterpillars live inside the berries of the spindle and their presence can be detected from the frass at the mouths of their burrows.

Other micro-moths include four species of "small ermine", *Yponomeuta cagnagella*, *Y. irrorella*, *Y. plumella* and *Ypsolopha mucronella*. The so-called Carnation tortrix *Cacoecimorpha pronubana* was first recorded in Britain in 1905 and is now quite widespread. This day-flying, golden-brown micro feeds on a wide range of plants, but one of its favourites is evergreen spindle.

The scarcer of our two barkbugs, *Aneurus avenius*, feeds on fungal mycelia under the bark of smaller boughs and twigs of a wide range of trees and shrubs, including spindle. The plant is also host to two aphids, *Aphis euonymi* and *A. fabae*. The first is chocolate brown and found in summer, the second is the common blackfly which infests broad bean and other plants in spring and summer. Its biology is complex, but spindle is its main primary winter host, broad beans and many other plants secondary hosts. In one of our local woods we have



a fine, mature spindle but almost every leaf had its margins rolled by the gall mite *Eriophyes convolvens*. Although spindle is quite common in our area, this is the only plant I have come across that is affected by the mite.

Wild spindles are relatively easy to grow from seed (this is how we acquired ours) and one or another of the cultivars or exotic species are normally obtainable from larger garden centres or tree and shrub nurseries. Although the wild forms grow well here, they are much shyer in fruit than varieties such as Red Cascade. It may be that they need to be quite old before they perform well since wild examples in our local countryside fruit readily enough.



Wildlife enrichment

by John Bocock (4211)

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I am carrying out a project aimed at suburban gardens, the main objective being to encourage awareness and interest in a wide range of wildlife, the invertebrates in particular. Any proposals should be acceptable to the average gardener and his/her neighbours. It would involve the planting and encouragement of native plant species which as with any habitat, wild or cultivated, would need ongoing monitoring and management. There may be a need to disguise some habitats of foodplants with more conventional garden plants, while also accepting that many wild plants can be interesting in their own right without necessarily being invasive. Unfortunately a hallmark of successful gardening is often seen as "overcoming nature's imposing order", an immaculately tended garden can be an important status symbol. So much for Jack by the hedge, the Orange tip or stinging nettles and their vanessids. There is a need to make wildlife gardening acceptable, fashionable, exciting maybe introducing a "must have" element. The commercial garden related industries are vast. Could these be turned to the advantage of wildlife above and beyond bird boxes and pond liners? Can we influence market trends?

Examples are needed of small scale wildlife conservation and enrichment projects that have been successful. Domestic gardens "wasteland" surrounding commercial buildings and other odd corners. An exchange of ideas would be welcome along with any available photographs and management details.



Collecting in Kazakhstan

by Jonathan Cooter (3290)

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Having returned from a successful and enjoyable visit to parts of the Western Tien Shan and Karatau Mountains of south-western Kazakhstan, I thought a few notes might be of help to anyone planning a similar visit. There are several "eco-tour" companies offering guided package holidays to this and similar locations.

My travel was by direct scheduled flight from Heathrow to Tashkent, Uzbekistan, then road, via the border crossing just north of the city to Dzhabagly village, Chimkent Region, Kazakhstan. There are direct Heathrow-Almaty flights, but the journey from Almaty to my base involved an overnight 600km rail journey followed by a road transfer.

I should point out that I had permission to collect insects and to export them. This was arranged with the Kazakh authorities **prior to my arrival**. I had been invited to collect insects in the Aksu-Dzhabagly State Nature Reserve and needed to export the catch in order to identify it. I have no idea what the border formalities would involve if a collection of insects was discovered by Customs officers amongst one's baggage. Upon arrival at Tashkent, a box of small glass tubes showed up in the x-ray screening as a suspicious object, indeed, even I thought it looked suspicious upon seeing it on the monitor – it looked like a box of rifle bullets. Needless to say it was at the bottom of my bag and I had to remove just about everything else to get at it. Upon realising it was not ammunition the Customs Officer asked by mime and a few words of English what I needed the tubes for. This is precisely where a letter of invitation in Russian comes in very handy. Indeed seeing the letter seemed to put me into a different bracket – not a tourist, but an invited western scientist (or eccentric Englishman – whichever – they wanted nothing more to do with me). Tashkent is the only airport I have been through where officials actually check the label attached to your luggage with the label stuck into your airline tickets. This is an eminently sensible precaution and it made me wonder why international airports in Europe seem not to bother enforcing this simple check.

Apart from that one check, the entry and subsequent border formalities are straightforward, but protracted, involving lots of form filling, listing all valuables, money, firearms and ammunition, a task not made easy by all the forms being in Cyrillic. However, there are some officials with a working knowledge of English, and the one I met on



crossing back into Uzbekistan when returning to Tashkent was very helpful; even those without English are adept at mime. I found out, rather late in the day, that there are English translation enlarged copies of the forms available, if not on display in the check-points.

As is often the case when collecting abroad, the question of what can be crammed into the 25kg airline luggage allowance raises its bothersome head. The matter is complicated by the need to pack a sufficiency of everything – clothes, personal necessities and entomological equipment. Excess baggage is expensive, even when pre-paid. Thoughts of having to part with around £25 per kilo focus one's mind perfectly when packing. However, it still leaves that worrying unknown – will so-and-so foreign airport include cabin luggage in the weight? Some do, some don't. I was to find out on my return that Tashkent does, but a few polite apologies works wonders – no charge was made (that time).

My baggage contained a sponge bag of personal necessities (including that paradoxical substance for an entomologist – insect repellent) a tube of travel wash and high factor sun block; two pairs of trousers, three T-shirts, three pairs of pants, ditto socks, ditto hiking socks, sweat shirt, two thermal T-shirts, two shirts, hiking boots plus spare laces and *Dubbin*, multi-pocket waistcoat, cagoule, waterproof over-trousers, waterproof gaiters, a riding helmet, a hat, camera and films, two Maglite torches plus spare batteries, a thin tent guy rope (ca 5m long) with adjusting clips and two cup hooks.

Before going on to list my collecting equipment, a few words about the items listed above. Travel wash is a very useful product, it can be used equally well for personal washing, shampooing and washing clothes. It is light and cheap, so there is no need to bring it back home. The sun block is a very advisable item for anyone going to the hills where the UV component of daylight has more effect. Whilst travelling I was wearing "one set" of clothes and a waterproof jacket (regardless of the temperature, they are heavy and baggage needs to be light), the rest in my baggage being spares. I work on the basis of one garment on, one drying and one spare, hence three T-shirts, pairs of socks etc. By wearing several layers, you can easily keep warm (on one cold day in the mountains I wore a thermal T-shirt, T-shirt, shirt, waist-coat, cagoule and over-trousers – I was perfectly warm). A single T-shirt (plus trousers etc) served well whilst on the steppe in temperatures over 30°C. Build up layers of thin clothes if cold. Never bother with pyjamas (unless your mother/wife does your packing) – pants and T-shirt do the job, on the night temperature dropped below zero, an extra



T-shirt was all that was needed. I have never understood why so many people insist on wearing hats as an everyday item. However, I was persuaded to purchase a hat to keep the sun off my head and neck. I wore it daily and it did the required job. The gaiters were purchased in lieu of a tick-borne encephalitis immunisation, at £10 they are good value and will last many years. The immunisation, not available on National Health prescription, would have cost me £55.40 and offers a degree of immunisation for about one year. Riding helmet – this really is an essential item if horse riding. In the event of injury your insurance company will first want to establish if you were taking the necessary basic precautions, ie. wearing a helmet. Having said that, I found it very uncomfortable in the heat and did not bother using it after the first couple of hours in the saddle, but this was a risk I chose to take. The guy rope is multi-purpose, it is stretched between the cup hooks and can serve as a washing line or hanging rail (in lieu of a wardrobe or to hang the extractors from). It must go without saying – surely nobody would be as stupid to do otherwise – bring your collection of material home in your cabin luggage or pockets, *never* put it in your suitcase.

This might seem a sensible place to mention horse riding. The distances travelled each day in the mountains are not great and can be walked easily. However, having transport is very useful especially if carrying bags of sieved leaf litter and other equipment. The horses supplied were sturdy docile beasts well used to off-the-road work lugging loads. Most are about 12-14 hands and quite young, two to four years old being typical. They come with a variety of tack, this can be made of rope, canvas straps or leather or any combination thereof. The saddles equally vary in design and comfort. My horse (a palomino called Ak'djail = White Mane) had a reasonable saddle, but some of my companions had to resort to extra padding (a jumper or towel). Again, the distances are not great and stops frequent, so getting "saddle sore" is not a problem likely to be encountered. During nine days, with fifteen people, there were four falls. One was due to a girth strap breaking, another when the horse slipped on the steep wet bank of a stream (alas, both happened to the same rider). The other falls were due to poor horsemanship – the best advice is to slacken the reins and let the horse tackle that stream crossing itself, it's done it a hundred times before and it does not want to fall and get wet. My previous experience of horse-riding was the four half-hour lessons I took in the weeks prior to travelling. The Kazakh horsemen were very helpful and would adjust the length of the stirrups, check the tightness of the girth and do anything else required or if asked. It is advisable to carry a



stick, simply wave it past the horse's eyes and it will walk a little faster straight away, no need to hit the beast. My stick was often an old hogweed stem, but the horse did not know that.

Now to the entomological equipment. This was minimal, bag-sieve and sample bags, two Winkler extractors, 23 one-litre yoghurt cartons, pooter, 2lb jam jar, two lunch boxes with layers of cellulose wadding, one litre of 70% alcohol, box of collecting tubes, three thick glass screw cap tubes, one full of ethyl acetate, two metal boxes, one box of 100 two-inch and half-inch tubes with polythene caps (the "ammunition" noted earlier), kite net with sweep net bag and nylon net bag, tea-strainer, plastic tray, trowel, 24 four-inch lengths of wire, forceps, scissors, lens, paper, toilet roll, note book, pencils, scalpel. Last, but by no means least for mountain collecting, a hand-held altimeter.

This is the equipment of a coleopterist; everything marked * is abandoned before returning home. The lunch boxes are for dry preserving large beetles, the small polythene capped tubes for smaller beetles in spirit. The jam jar* serves as a killing bottle, is packed with sample bags. The yoghurt cartons* are pit-fall traps and the lengths of wire* serve as skewers to carry the meat bait (these are bent into a "V" of wire then placed across the top. This way the beetles still get attracted and fall into the trap, but they do not get to the meat, eat it or get covered in fat and decomposition products). The trowel* is a general purpose tool for digging, scraping up litter, working dung etc. Tea strainer* serves as a water net, the remaining items are self-explanatory, except perhaps the two metal boxes. Metal boxes show up as metal boxes in the airport x-ray machine. My cardboard box of empty tubes, which so readily attracted attention on the way in, was substituted for two smaller metal boxes containing filled tubes of beetles in spirit. No x-ray detection on the way out, simply two four-inch opaque shadows. Indeed I got the impression the Tashkent x-ray operator was suffering fatigue from our party – one member of which had a horse shoe in his cabin luggage, tripods, electric razors, video camera battery packs and sundry other eccentric souvenirs or high-tech devices attracted all the required attention.

Although this kit, clothes and equipment has been refined over the years, I would make adjustments to it for my next outing. A head-mounted torch – in the mountains our only source of light, apart from any torches we brought with us, were candles. The Maglites set in "candle" mode served us well, but it was a struggle at times getting all the catch killed, labelled, packed (dry or in alcohol). This could be done in daylight, but why travel half way round the world to waste



valuable daylight collecting time doing something that can be done in semi-darkness? Possibly a global positioning device. The altimeter is more accurate and I was able to get latitude and longitude (essential to record these in the more remote parts of the world) from a Russian military map (purchased from Stanfords). GPS might be more versatile – or perhaps more bother!

Definitely a cape of size sufficient to cover back-pack and saddle of horse. When riding in hail storms and heavy rain, you can be assured that the water will seep in somewhere; cagoules and over-trousers are designed for walking, not sitting. A more annoying feature of riding in the sun were horse flies. They would congregate on my ankles and calves, often biting; invariably this happened on the days I failed to pack my insect repellent; again a stick came in handy to swat or brush the horse flies off me and the horse.

That essential item of equipment, a flight interception trap would have meant an excess baggage charge . . . but think of the huge bulk of insects it would produce. I thought hard about this and in the end financial constraints won. Life can be unfair at times.

Walking in the mountains is safe if you keep to the paths, cut foot holds across snow fields and take care when progressing through tall meadow vegetation – there might be boulders or depressions. Worse still there might be a family group of Wild Boar snoozing during the day. Wild Boar were in evidence around our mountain base, turf grubbed during search for food. Luckily none were encountered, the alpha-male is as large as a domestic boar, but has tusks and attitude. The paths are often steep, sometimes covered in loose stones, the horses cope perfectly, as did the older members of the party (the eldest being 83!). I dislike heights and tend to drop on all fours if the slope down is too steep for my liking or likely to be slippery. At the risk of sounding like an entomologist on Viagra, I'm pleased to report I stayed erect for the entire trip. Except, that is, on two occasions when deciding to cut foot holds whilst traversing a 40° - 60° snow patch. The snow had iced over, looking up the slope into cloud was OK, but looking down into the valley the kilometre or so of snow patch extending to the valley below looked decidedly dangerous; once you start sliding, there's little chance of stopping, unless you hit a rock outcrop or reach the boulder strewn scree at the end.

Isabelline Brown Bear, Ibex and Marco Polo sheep live in the mountains, all those seen were in the distance with the aid of binoculars. Marmots were evident, the species here being a little larger than the European badger. They are secretive animals, but their bright



orange-brown coat shows well against the verdant background. The fleas of these marmots are vectors of Bubonic Plague (endemic in Central Asia) so I was put off grubbing around the entrances of their burrows for Cholevid beetles. Life being unfair yet again.

There is no immunisation available against Bubonic Plague, but it is advisable to have anti-rabies and all the others recommended by your GP. Tick-borne encephalitis is reported to occur in the region and there is an immunisation available; personally, having assessed the likely risk, weighed this up against the £55.40 cost (see "gaiters" above) I decided against it; only one out of the 15 reported a tick bite.

Accommodation in the mountains is basic, but more or less what you should expect in such a remote area. The "mountain hut", used by several tour groups, had no doors, no heating and glass in three out of 12 windows (polythene sheet being nailed to the others). The Kazakhs had made great effort to introduce a few home comforts – a hot shower being generally appreciated by all. The beds were of the iron framed, sprung mattress type, the springs having seen better days or a succession of abnormally obese occupants. They were very comfortable once you got used to them, and the duvets and mattresses were very warm. Food was excellent and abundant, as was tea (the popular brands all being Ceylon blends), coffee (Nescafé in Cyrillic-labelled jars), beer and vodka (excellent Kazakh varieties at \$US2 per bottle). The variety of dishes is more akin to European than Oriental/Indian. Mildly or un-spiced dishes, pasta, rice, potatoes, bread, dairy products, abundant fresh fruit (apricots, cherries etc) and home made preserves. Accommodation in the village for our time on the steppe was excellent by local standards. I use this qualification to point out that the area is remote, the power supply might (does) fail occasionally, the water might not always be heated. But this is nit-picking, our party were treated as honoured guests, given excellent meals and packed lunches, plenty to drink, more of everything on asking (though nobody did, apart from such essential items as water, beer and vodka).

Transport was by a sturdy 18-seater bus, strangely with petrol, not diesel engine and not four-wheel drive. It got us everywhere a road or dirt track existed and the driver was top class with great consideration for the comfort of his passengers, not an easy task in a vehicle so heavily sprung being driven over rough tracks or metalled roads with most of the metal missing.

There is a list of just over 700 species of Coleoptera known from the Aksu-Dzhabagly Reserve. I have managed to add to this considerably



and initial study shows a number of species "new to science" amongst my material. This includes a new species of *Hydraena* – possibly the first record of the genus for Kazakhstan and several new Staphylinidae: Omaliinae and one, possibly two new *Stenus* and one *Lathrobium*. The few Diptera I collected also included a few interesting species – the bibionid *Dilophus obscuripennis* for example. Known only from the holotype female in Budapest Museum collected many years ago in "Soviet Central Asia" and lost in 1956; my series consists of males and females, 28 examples in all. Flying with this species was the familiar *Bibio marci*. Beetles included familiar species too – *Agonum dorsale* under stones at 2600m, *Coccinella 7-punctata*, *Chrysolina polita* come to mind.

I found the montane beetles became more evident above 2500-2600m altitude. Wet places, especially snow melt areas produced the greater variety (as indeed is expected in any mountain area). Grubbing and treading the wet turf produced beetles in fair numbers. Horse dung was profitable, but colonised and abandoned with amazing rapidity. The dung deposited by our beasts on the morning's outward journey was crawling with life on our return. Unfortunately I was not prepared for the agility of the insects on dung or carrion. Even Histeridae ran with a rapidity a tiger beetle would have been proud of. Fortunately insects were present in such numbers at dung or carrion (there was a pile of pig entrails in the garden of our guest house in the village, no butcher shops here, self sufficiency is the norm) failure to catch any species was not a problem – miss one, there's several more to try for. However, the best way to secure the dung-inhabiting species would have been to place the dung in an extractor. The bulk of the larger Staphylinidae I captured were well known species, some with Palaearctic distribution, others Holarctic. Sweeping was of little use, but searching plants in flower was not a good way to obtain beetles. One of our guides was Dr Anna Ivaschenko, Kazakhstan's leading taxonomic botanist. As a result, most of my phytophagous beetles have the plant accurately recorded.

I hope this brief offering might be a help to anyone thinking of travelling by air to temperate mountain regions. I thought I had encountered the world's worst toilet whilst in China. This consisted of an un-roofed three-and-a-half walled building with trough set in the concrete floor at one side and three holes smashed through the concrete at the other, the floor having a void underneath. No, it was surpassed by the one at the back of the Kazakh Customs post, Tashkent. A similar construction and function, but with a roof, door and



no windows (or lighting). Whilst dwelling on toilet matters, it is worth pointing out that all members of the group, at one time or another, suffered "upset stomachs". Perhaps "suffered" is not the right choice, everyone had time to get to the loo, nobody was in agony or became so dehydrated as to be of clinical concern. I took with me a broad spectrum antibiotic, prescribed by my GP for this type of problem. Do not rush into taking such strong remedies; your digestive tract might simply be adjusting. Give it two or three days, if no improvement, then start with the antibiotics; drink plenty of water to prevent dehydration, either as a result of the heat or illness. Being English, such situations are not without their humour. In the mountains, our meals were taken round a large table, seating on one side of which was on two planks resting on two stools. The other side of the table has eight stools of various construction and ages. These also served as bed-side tables so were often not in place in the dining area, or were not at the table. "Can you pass a stool" thus took on an ambiguous meaning and was often met with the reply "Just about" or "Not yet" as your companion proffered the requested seat.

Returning home on my birthday enabled me to wangle my way onto the flight deck. I was surprised at its small size and only a pilot and co-pilot. The aircraft flew by computer. The pilot informed me all he has to do is to tap "E N G" plus enter on his keyboard and the plane will fly itself to Heathrow. This caused me to recall TV images from a French air show of an aircraft, of the same type, over-shooting the runway and crashing into the woods. Fly by wire indeed, as our flight turned west just south of Moscow and headed across the Baltic, I just hoped the boffins had sorted that problem out.



Millennium Peacock

by Brian Gardiner (225)

2 Highfield Avenue, Cambridge CB4 2AL.

A Peacock butterfly flew across my garden on 1st January! I think it came out of the bird-box on the apple tree attracted by the warm sun we had on that day. Usually the box is full of earwigs and woodlice rather than the birds it was intended for.



PLATE 00I. Coxcomb prominent moth caterpillar with brood of *Eulophus ramicornis* larvae in "ring" formation. Dorsal view. 17th September 1998.
(Ellis, Observations on the parasitoid . . .)



PLATE 00J. Brood of twenty-two mature *E. ramicornis* larvae arranged in circle on oak leaf. Caterpillar has become detached and larvae are now yellow-green and plump, with head directed inwards. 18th September 1998. (Ellis, Observations on the parasitoid . . .)



PLATE 00K. Brood of pre-pupal *E. ramicornis* larvae each with a "pillar" of faecal pellets.
19th September 1998. (Ellis, Observations on the parasitoid . . .)



PLATE 00L. Recently-formed pupae of *E. ramicornis* attached to leaf. Last larva to pupate is paler but rapidly became black like the others. All pupae overwintered.
20th September 1998. (Ellis, Observations on the parasitoid . . .)



PLATE 00M. Caterpillar of Scorched carpet moth (*Ligdia adustata*) on spindle.
(Roper – The virtues of spindle)



PLATE 00N. Forager ant in the process of cutting a piece of leaf – note the semicircular cut and the body straddling the cut so that both parts are supported.
(Wilson – Leaf Cutting Ants . . .) Photo: Nick Holford



PLATE 00O. Forager ant having cut a piece of leaf is now manipulating it to a position over the body so as to carry it to the nest.

(Wilson – Leaf Cutting Ants . . .) Photo: Nick Holford

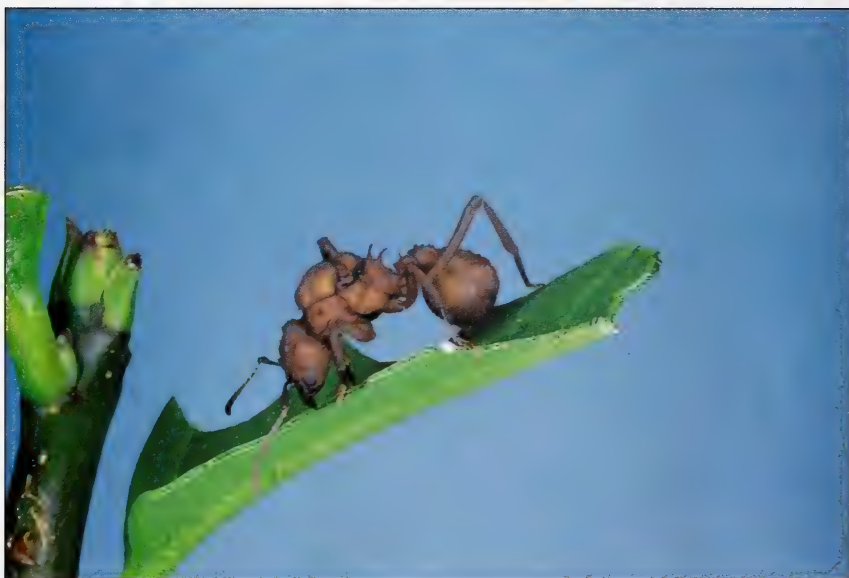


PLATE 00P. Sterile Queen. These are about 16-20mm long, whereas "normal" foragers are about 8-10mm in length.

(Wilson – Leaf Cutting Ants . . .) Photo: Nick Holford



Leaf cutting ants

by Scott and Kevin Wilson (11343)

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A brief history

Acromyrmex octospinosus and *Atta cephalotes* species

These species of ants are only found in the hot humid rain forests of (The New World) South America. The colonies of *Acromyrmex* and *Atta* sp. that are being suggested, have been imported from the northern mountainous tropical rain forests of Trinidad. Altogether there are 15 different types of *Atta* sp., and 25 of *Acromyrmex* dotted around Brazil, Columbia and as far north as the state of Texas where *Atta texana* lives.

Depending on one's personal view, in their normal habitats they are either considered to be environmental pests by farmers (who must suffer huge losses to their crops because of the massive appetites of mature colonies), or beneficial, as they also improve the soil (because of their deep excavations they increase aeration and drainage, as well as introducing leaf matter deep into the ground).

The mature nests in the wild can be enormous, being up to 20 feet deep, and well over 40 feet across. Mature colony sizes of *Atta* sp. (in the wild) range from 700,000 up to about 8,000,000 with a nest size to match. The colony never seems to tire, and cuts leaves 24 hours a day. Once the leaf is cut (Plate 00N) and taken to the nest (Plate 00 O), it is handed over to other workers. These then proceed to lick and clean the leaf. Then it will either be stored for a while (this also helps to control the humidity inside the nest) or taken straight to the fungus garden, where it is chewed up into smaller pieces by other workers and minimis (very small ants also known as the gardeners) before being added to the fungus. The fungus (mycelium) bears fruit which look like microscopic mushrooms called gongylidia, and this is what the colony feeds upon. Although moisture is also taken from the cutting and chewing of the leaf matter, the minimis also weed out other types of harmful fungus and bacteria which may also be growing on their food.

Atta sp. could have many hundreds or even thousands of fungus gardens in the nest, ranging in size from a golf ball up to a football. *Acromyrmex* sp. usually only have one large fungus garden, or even a few smaller ones. Comparing the fungus between the two colonies, the type cultivated by *Atta* is the more productive of the two. This is obvious when thinking about which has the largest colony size.



Even as early as the 1930s, *Atta* sp. were put on display in the USA. It was some time after that, that zoos all over the world started to exhibit these amazing organised miniature societies. Then in the 1970s, "Butterfly Worlds" were starting to take off in a big way (and are more popular than ever today, because of the more exotic species that are readily available from all over the world). The temperature and humidity for exotic butterflies is about the same as for ants, so displaying them in these artificial environments was the next obvious step.

Anyone who is willing to give them the attention they need, such as space, heat and fresh food every day, cannot fail to be amazed at how readily they will adapt to a laboratory style home.

Watching and analysing the improvements that are made daily, from humble beginnings to a colony that can dig a new entrance hole in a matter of one hour, cannot help but fascinate many people. Seeing ants communicate with each other, finding food and getting excited, trying to tell others about what has been found. Laying scent trails all over the leaves that are to be cut. Going back to the nest after leaving a foraging scent trail, and others following it back to the food source. Helping each other carry pieces of heavy soil or leaves, grooming a nest mate, these are just a few minor things that can be noticed as soon as you start to watch them.

Movements can be analysed by the amateur enthusiast, and some really fascinating observations can be seen to happen right before your very eyes. Some things have to be seen to be believed, and at times you will not believe what you are seeing. Just follow the simple instructions, and once the first few months of trial and possibly the odd error have gone by, added together with a little bit of panic here and there, you will have something really impressive in the end to be proud of for all your efforts.

Caring for leaf-cutting ants

When visiting zoos and butterfly worlds, the colony of leaf-cutting ants is always the most popular with adults and children. The sight of a large captive colony always stimulates the mind and brings forth lots of questions. The very approachable and quite knowledgeable people who care for these colonies are very helpful in answering any questions that the public might have. That is, until they are asked, "Where did you get it from, and can I buy one?" Then the helpful mood changes, and an off-putting attitude kicks in. "You don't want to get a colony



like this, it gets too big and is very difficult to look after". It is that sort of attitude that puts people off, and they think that because the expert has advised against getting a colony he must be right. Well, one answer could be that if everyone knew how to look after, and care for such a fascinating subject, then nobody would want to pay nearly £3.00 per person to see their star attraction.

Looking after a colony of leaf-cutting ants isn't so difficult, I would say that once everything is set up properly, that a colony is easier to care for than a household dog.

The four main points for looking after a colony are:

1. Space – there must be enough space for the colony to expand, so a medium to large aquarium is the best bet; it can also be added to in the future.
2. Temperature and humidity – the nest tank must be kept at the correct temperature, which should be constantly between 23°C and 27°C (but beware of direct sunlight).
3. Food – the foragers cut only certain types of leaves. These are chewed up and added to the fungus garden. If the leaves are no good the ants will reject them. Fresh food must be offered daily and the same food should not be given for more than two days in a row, as they like to have a varied diet.
4. Security –this is for our benefit, there must be no escape. Because if one can get out, more can, and will follow – as I found out one morning when I walked into the room where they are kept, and they were climbing all over the walls.

If the four key points above are followed (the basic methods for keeping both species are exactly the same) and the tank or a larger variation that is described in these notes is used, then, if a colony of *Atta* or *Acromyrmex* sp. is purchased it will live a long time, as the *Atta* queen lives for up to 20 years and the colony could be as large as 700,000. *Acromyrmex* sp. queens live for about ten years and have a colony of between 10,000-15,000.

Setting up a nest and feeding tank

The nest tank should be at least 4' x 18" x 18" with sliding glass tops. At either end of the glass tops cut some aluminium mesh and "glue" these into position with aquarium or glazier's sealant, making sure that there are no gaps for the ants to squeeze through. With the mesh in



place it will provide a flow of ventilation through the tank. This is because heat is generated inside the nest and fungus gardens, the ants open up ventilation holes on the top of the nest to provide the fungus with a constant flow of air.

The tank is half filled with a good peat, and a heat mat is attached to the back of the tank, half below and half above the peat. This heats the top layers of the peat which also heats the air as it would do in their native environment. The temperature needs to be controlled with the help of a thermostat. The whole set-up should be left for at least two days to see if there are any variations in temperature that will be harmful to the colony. Temperature is the most important factor between success and failure.

At the same time as setting up a nest tank, providing a feeding tank is also a necessity. A good size to start with would be 2' x 18" x 18". This must also have sliding glass tops, with a 5" gap at one end with aluminium mesh glued into position the same as the nest tank. (TIP: have two feeding tanks, then when one starts to get full of rubbish simply change the tanks over and empty the full one.) If the feeding tank is placed next to the nest tank, heat can seep into the feeding tank so there would be no need to heat it. (The ants can work in slightly cooler temperatures while foraging, it is really the fungus garden which needs the consistency in the temperature.)

The nest and feeding tanks should be joined together with clear plastic tubing of at least 1¼" or 1½" in diameter. This is easy to do, as all you have to do is cut a hole in the aluminium mesh which will be the approximate size of the tubing. Push the tubing through the hole and put sealer between the tube and the mesh to secure it into position. Close any gaps that could let the ants escape. The tubing can be as long as you want. Once the colony gets larger there will be more foragers ready to cut leaves, so the distance that the ants have to walk on their "foraging trail" also keeps them occupied, so that they are not trying to find a means to escape.

Once everything is set up and the temperature is correct, it will be time to introduce a colony.

Choosing the colony

Worker ants of *Acromyrmex* sp. are larger than the ordinary workers of *Atta* sp., so if there is limited space, these are the best bet.

Atta sp. are more polymorphic, and have larger casts of workers, which are sub-majors and majors (soldiers). These ants are very large



and the incisors can cut through human skin. *Atta* sp. are also different in colour (from *Acromyrmex* sp.) being a lighter brown with a shiny appearance.

Choosing which type of colony is up to the individual. But I would advise anyone considering buying one to visit firstly the supplier to inspect the colonies on offer. The reason for this is so that the colony can be seen feeding, and also to check the fungus garden hasn't deteriorated too much in transit. The colour of the fungus (in *Acromyrmex* sp.) should be a bright creamy colour, rather than a brown colour which means that it is in poor condition, which could take a while to repair if the colony isn't very large. The fungus for *Atta* sp. is greyish in colour. The purchaser should also notice that new leaf which has been cut recently will have been added to the fungus giving it a speckled appearance.

Transportation of the colony should also be done by you. The reason is, that if it is sent by courier it would probably not be handled too carefully, or it could even be left overnight in a cold place which will kill off the fungus and also chill the queen. This will cause problems (as I have found out in the past). If the queen has been chilled, she will be unable to lay any eggs.

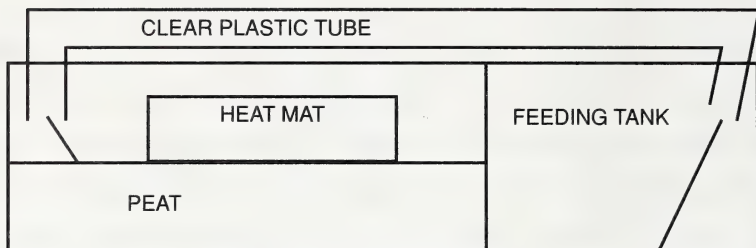
The numbers of ants in the colony is also something to think about, the larger the numbers, the harder it would be to kill off if there was some unforeseen problem with the temperature. But obviously larger colonies cost more. Medium size colonies are or have been for me a safe bet (I have bought *Atta* and *Acromyrmex* sp. medium-sized colonies), they also give greater satisfaction from seeing them develop from humble beginnings, to a huge mass of organised labour.

Introducing the colony to its new environment is the easy part, so long as everything has been set up and tested for at least a couple of days beforehand. A hole the same size and depth of the tub should be made in the peat, so that the top of the tub is level with the top of the peat. Make a hole in the top of the tub and carefully place a small twig through the hole so that the ants can climb out. Over the next week they will bury the tub and build a conical chimney structure (as in the wild). Food can be placed near to the nest entrance at the same time, but depending on the colony's needs at this time they may not cut anything. Fresh food should be offered every day. They do like a varied diet, and some foods will be seen to be cut in larger quantities than others. The best thing to do is to keep a diary of their activities and foods that have been offered every day. Also try and make a menu over ten days or so, so they do not become bored with eating the same old fare.

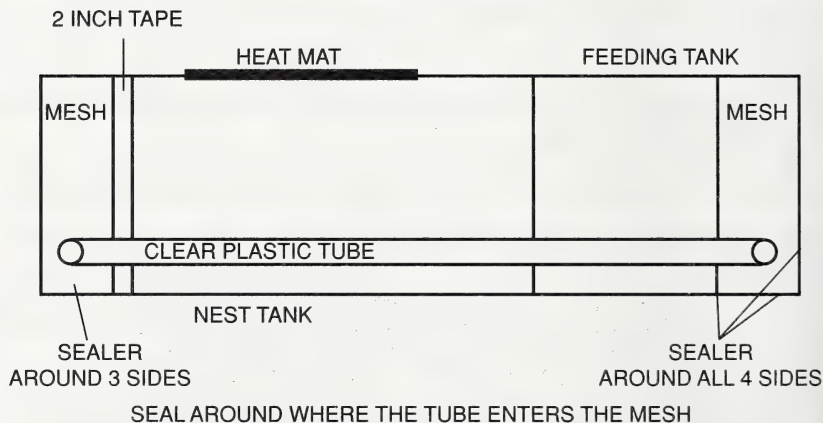


Plans for a nest/feeding tank

FRONT VIEW



VIEW FROM ABOVE



Food

The amount of leaf matter cut by the colony depends on their needs at that time. But there are also a couple of types of food that the colony will take at all times even if it not needed. There is always more food cut than they need, that's why leaves are sometimes dumped around the nest entrances. Some of the leaves are also used to control the humidity inside the nest in colonies of about 400 upwards. Smaller colonies of around 50 have to work really hard for food (because there are so few foragers) so they need a little help from a spray bottle once or twice a day. But the important point is not to make the peat too moist as this has a detrimental effect on the fungus, and could kill it off.



Spraying larger colonies should also be done every day, as they like to drink it and it is also used to control the humidity inside the nest, lining the chamber walls with the damp peat.

Table 1. Types of food taken by *Atta* and *Acromyrmex* species.

Orange	This is a great favourite, and will be taken at all times
Privet	The smaller leaves of a closely cut hedge seem to be taken more readily than the larger, more mature leaves.
Cabbage	Favourite
Beech leaves	<i>Atta</i> sp. seem to enjoy these leaves more than <i>Acromyrmex</i> sp.
Rose flowers	Favourite
Rose leaves	Favourite
Sweet apple	Favourite
Sycamore leaves	Favourite
Old English rose	Favourite. The colony will cut everything, including the stems
Raspberry leaves	Favourite
Brambles	
Weeping willow leaves	
Dock leaves	
Brussels sprouts	
Green grapes	
Used tea bags	
Glacé cherries	
Black cherries	
Lettuce	
Rhododendron leaves	

The list of foods above, is only the tip of the iceberg. There will be many more that I haven't tried yet so it is best to keep experimenting with different leaves and fruits. Especially when during the winter a lot of leaves, such as the rose and tree leaves lose much of their moisture content, or simply are not available. So the only alternative is to go to the supermarket or fruit shops for supplies.

Over the next few weeks the colony will settle down. The queen will take a little while to adjust to the new surroundings. After all she's come a long way from her native country without heat, and has adjusted to her temporary home of the supplier before finally being put into another and hopefully more suitable environment in your care.

Obviously the workers will dig their new entrances for the nest and explore the tank. This is when any gaps which could allow escape will be found. New workers could be noticed within a couple of weeks from the brood that was already inside the transporting tub. Eggs that the queen lays either during transportation or just after being put into



the tank could take from 56 to 75 days before emerging as adults. They also stay inside the nest for maybe another 18 days before taking up their duties outside the nest. If the fungus garden is small (and has died off a little more while taking it home) newly hatched workers could be culled by the colony if there is not enough fungus to support them. So don't worry if 50 or so dead bodies turn up over a couple of days, as they are only concerned with the survival of the colony as a whole, and not the survival of a few individuals.

Once the queen (Plate 00P) has recovered from what must be a very stressful experience, the assembly line like colony will start to get noticeably larger every day, and that is a very satisfying sight to behold, because it is at that point you know that everything is right for them.

Caring for, and watching such a hungry, tireless, organised society really is a joy, and of great fascination to all, as well as being a great talking point whenever we have visitors. As I have said before, they really are easy to look after, once the basic knowledge has been acquired, and put into practice. I hope that after reading this paper that I have prepared, it has made you think that you too, could also care for, and enjoy the satisfaction of having a truly fascinating and highly organised society at your house.

Controlling the size of the colony

If space in the tank is limited, or the colony outgrows its nest tank, there are two options open to you:

- Stop feeding the colony for two days, and then put their favourite food in the nest tank. Because of the lack of food (and with it being a favourite), a lot more foraging workers will start cutting. All that you need to do, is to transfer the food with the foragers still attached to it, into a plastic bag and tie the top. Place the bag in a freezer for a couple of hours, then throw the bag in the bin once that you are sure that all the ants are dead.
- The above method is to me, too drastic, to kill part of a colony which has expanded because of the efforts to get it to a size that looks impressive. Adding another nest tank, the same as the one that has already been supplied to the ants, is the best option. This will be occupied almost immediately, digging will take only a fraction of the time if there are thousands of ants. Plus this method will keep them occupied for some time, with having to transfer the fungus garden etc.



UFO crash-landing incident, Oxfordshire, 1997

by Dan Larkins (11365)

9a Mulberry Drive, Wheatley, Oxon.

"I've found a UFO in my garden" said a voice on the phone.

When this unusual statement was blurted out to me over the phone, it was early summer 1997 and I was Wildlife Information Officer with BBONT, the Wildlife Trust for Berkshire, Buckinghamshire and Oxfordshire. This position – which I held from August 1996 until August 1997 – was a year's voluntary placement as part of a sandwich university course and aside from being a highly enjoyable way to gain experience, it also gave me a great excuse to talk for hours and hours about wildlife.

It was my job to (do my best to) answer any queries members of the public had about anything that moved, grew or ate. This comprised of a huge variety of subjects from mass frog fatalities to the latest gossip on the Newbury bypass and in August and September I comforted dozens of irate – sometimes mystified! – garden owners whose lawns, which having been visited by badgers digging for leatherjackets, were showing marked similarities to minefields.

But it was the insect-related enquiries that I most looked forward to. Identification was the major asking point, but thankfully most tended to be instantly recognisable species. For example, one or two phone calls to the office did begin, "Hello... er, you may not believe this, but I think I've just seen a hummingbird." Hummingbird hawkmoths, together with Elephant hawkmoths, were having a good year (as a result of the latter, gardeners, *Fuchsia* bushes definitely weren't).

The UFO proved more difficult. A gentleman had phoned the office one afternoon and announced his capture of an unidentified flying object. As he explained, he was in his garden when a large flapping object crash landing on his compost heap caught his attention. He first took it to be a bird, but on closer inspection found it to be a huge butterfly or moth (he wasn't sure which) which seemed to be having trouble taking off again, so he caught it in a shoe-box where it died within minutes. It was broad-winged, brownish in colour with streaks, but was quite tatty and apart from these brief details he was understandably having difficulty giving an over-the-phone description, which can be exceptionally difficult even with perfect specimens. After all, it's all very well describing a "broad-winged" creature, but "broad-winged" as compared to what?



"I've never seen such a big one and I can't find it in any book", he ended.

My experiences thus far had told me that through no fault of theirs (not all of us are particularly interested in invertebrates after all), most insects or spiders that appeared unusual and exotic to the layman were not – after scrutiny – particularly so. I therefore voiced my suspicions that he may be in possession of one of the larger hawkmoths or perhaps an Oak eggar or Goat moth. Still noteworthy, but as British as the Queen. "No, they're all in my book and it's none o' them", came the reply. "Besides, this is bigger".

He couldn't possibly be in possession of a Monarch butterfly, could he, I wondered? "Are you able to measure it?"

"I'll do better than that" he replied, "It's too big to post, but I'll bring it in at lunch time tomorrow if you like."

It was a large shoe-box that the gentleman brought in the following day. "Sorry it's dead" he regretted, "but I honestly don't think it's from around here." As he opened the box I peered in and found myself gazing straight at the mystery lepidopterid. Tatty, but magnificent. "Oh my *gooooorrrrd*" cried a workmate which echoed my thoughts exactly.

"Fascinating" I said, probably sounding for all the world like Mr Spock. "It's an Atlas moth! I think it's originally from south-east Asia but I doubt he'd have flown here without being picked up by radar . . . It's obviously escaped from a collector or breeder."

"You mean to say people keep them as pets?" the gentleman said, looking a bit shocked.

"Yes." I said. "As a matter of fact I had one recently. They're wonderful to study and photograph. They're the world's largest family of moths."

"I can believe that. You can have this one if you like. I reckon it would make a pretty good mobile if you attached it to a string . . ."



The first and last of the new and old millennia?

by Peter May (10514)

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I wonder if the Red admiral I saw in Bognor Regis on 4th December 1999 and the Small tortoiseshell seen during the morning of 8th January 2000 were the last British butterfly seen in the last millennium and the first of the new one?



Tenerife – A collector's tale

By Steve Searle (11648)

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This years family holiday it was decided would be Tenerife, based largely on the fact that my father-in-law owns an apartment there and that we couldn't find another late booking.

As I have recently returned to entomology I immediately made what enquiries I could in the short time available to ascertain what species of butterfly I would be able to obtain whilst there. I used the *Field Guide to the Butterflies of Britain and Europe* by L.G. Higgins and N.D. Riley and laboriously went through all the distribution maps to see what would be available. I also tried the Internet (being a new "surfer") and was pleased and surprised to find Simon Coombes' web site at <http://www.captain.ndirect.co.uk/regions/tener/tener.htm> entitled *A short visit to Tenerife, April 1997*. This was a most informative guide to some of the species that can be found on the Island.

Therefore happily prepared with information, net, paper triangles and boundless enthusiasm I went on holiday with my family. I even managed to curb my enthusiasm on the first day and waited until the Sunday afternoon before popping the question "Do you mind if I pop out for an hour or two with my net". I was even sneaky enough to volunteer to take my three-year-old daughter with me and my older sister who had accompanied us.

The apartment is situated at a place called Tabaiba which is just south of the capital Santa Cruz and only a short 10 or 15 minute drive from the spine of the island where there are trees and vegetation, something that is sadly lacking in the vicinity of the apartment and most of the south of the island.

I soon reached the main road that led up to Mount Teide just outside La Esperanza and almost immediately found a clearing in the pine forest with some *Euphorbia* in bloom. I parked my vehicle and crossed the road, net in hand. Flying in the sunshine I spotted Small copper, *Lycaena phlaeas* and Canary blue, *Cyclurius webbianus* but before I could literally do anything a vehicle with an official looking badge on the door pulled to a halt in a cloud of dust. Alighting from the vehicle was a uniformed man who I had no doubt wanted to speak to me.

My Spanish is restricted to ordering beer and food and it became obvious that his English wasn't even that good, but his signs at my net indicated that something was wrong. Within five minutes another three



vehicles arrived and an official who was supposed to be able to speak English. I was politely told (eventually) that to collect butterflies I would need a permit and he wrote down the address and phone number of the department I would need to contact (not before I had been searched to ensure that I hadn't caught anything before their arrival).

I made contact the following day, visited on Tuesday (by the simple expedient of getting a taxi, always the best way in strange cities), filled out an application form and waited. On Wednesday I was contacted and told I would need some form of certificate to show that I was a genuine collector. I therefore contacted Nick Holford who immediately e-mailed a certificate to my father in Exeter and after ascertaining the correct fax number faxed it to the department. On the Friday, a week into my holiday, I was able to collect my permit.

The permit came with restrictions, I was not allowed to collect in the National Parks and would need a different permit for them, I was only allowed to take two specimens of each species, I was only allowed to collect butterflies and nothing else and finally I had to take whatever I had collected to the Natural History Museum in Santa Cruz for them to examine before I left the island (this was in case I captured something unusual or rare). All the conditions are in Spanish and I hoped that I understood what was expected of me, as there was no one who was able to explain them in English.

Was it worth it? Of course it was! Although it soon became apparent that September was probably not the best month to collect it was still very interesting. I assume that because it was at the end of the summer a lot of species were scarce waiting for some moisture. Everywhere was extremely dry, even the north side of the island which is normally the greener side. I visited as much as I could, being mostly guided by Simon Coombes' internet guide, which I had printed out. I found *Vanessa vulcania* in the fields behind La Esperanza along with *Lycaena phlaeas*, *Clyclyrius webbianus*, *Pararge xiphioides*, *Hipparchia wyssii* and *Pieris rapae*.

In the mountains behind Las Mercedes I found *Gonepteryx cleobules* but only on the very top in rides that have been cut along the ridges. At the bottom of the mountain despite it being heavily wooded there was nothing unless you wandered out into the fields where *P. rapae* was everywhere. Along with *G. cleobules* there were *C. webbianus*, *L. phlaeas* and *P. xiphioides* in fairly large numbers. The mountains in this part of the island are wooded at the base but on the very top give way



to tree heathers some of which are surprisingly large, these coupled with the extremely steep and rocky slopes make movement off the tracks almost impossible. The floor of the forest is almost devoid of other plant life due to the dense canopy the heathers provide. Therefore the vast majority of the butterflies I saw were on the road verges feeding on *Euphorbia* which seemed to be the only nectar source available outside of cultivated gardens; again I can only assume that in the spring when it should be greener things would be different.

I also travelled down the island to a valley above Los Gigantes where there is a small town called Santiago del Teide. This valley is quite flat and cultivated but again very dry. It was here that I saw my only Long-tailed blue, *Lampides boeticus*. According to Simon Coombes they were common along the waterways when he was there in April; these were bone-dry together with the vegetation along their banks.

My only other sightings of note were of *Danaus plexippus*, which appeared outside our apartment one afternoon and spent ten tantalising minutes drifting around in the air currents five floors up before disappearing, and what I can only think was *Issoria lathonia*. This I saw in the pine forests on the slopes of Mount Teide but never close enough for a positive identification, interestingly this was at about 8000 feet where *C. webbianus* and *L. phleaes* were also present in large numbers feeding on, you guessed it, *Euphorbia*, again the only source of nectar that I could see.

The day before my departure I duly presented my catch at the Natural History Museum where it was examined by Gloria, who again could speak no English. I was able to purchase there *Mariposas de Canarias* by Marcos Baez for 3500 pesetas, about nine pounds. The text is all in Spanish but covers all the butterflies and moths found in the Canary Islands with photographs of actual specimens of every species including, where differences exist, male and female.

Having kept you waiting this long I will now let you know how to get your permit if and when you visit the island.

The address to contact is:

Excmo. Cabildo Insular de Tenerife

Unidad Insular de Medio Ambiente

C/. Diego de Almagro

Hogar Infantil Sagrada Familia. EDF, Miramar.

The telephone number is 922 239081 and the Fax is 922 239191. The gentleman I spoke to was Jose Albierto and his assistant Sarah; they



were both very friendly and as helpful as they could be, given the language difficulties.

And finally, was I ever asked to produce my permit? Of course not, Murphy's Law would of course have kicked in had I not had one and I would have no doubt been asked for it constantly if I hadn't had one.



An unusual prey for a Tiger beetle larva

by Neil A. Robinson (10002)

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On 26th June 1999, when I was taking a Natural History Society group round Gait Barrows National Nature Reserve in Lancashire, we visited the margin of Hawes Water, a small marl lake which is included in the NNR (not to be confused with Haweswater in the Lake District). The hard white shell marl which formed in this lime-rich lake is exposed on a footpath along the lakeside. In this there were numerous holes inhabited by larvae of the common Green tiger beetle, *Cicindella campestris* L. These vertical holes are so perfectly circular that they look as if they have been bored by an electric drill, and they differ from the holes of mining bees in that they are not surrounded by a "mini-volcano" of sand. (I wonder what the larvae do with the spoil – do they flick it away?) The head and front part of the thorax of the larva form a toughened disc which perfectly fits the top of the hole. The larva waits with the rest of its body down the hole, ready to grasp any passing prey with its long jaws, and drag it down its hole. Several adults were running about the path, moving very fast and taking flight readily.

A blue damselfly was also frequenting the path, settling occasionally to sun itself. Suddenly we noticed that all we could see of the damselfly was its head and thorax projecting straight up out of the ground. Evidently the tip of its abdomen had brushed the head of a waiting beetle larva, been seized, and dragged down its tunnel. While we watched it was pulled further down, its legs folding up like an umbrella being turned inside out, until it finally jammed with its wings projecting vertically into the air. It cannot be very often that an aerial artist like a damselfly has the misfortune to fall victim to a subterranean beetle.



The no-spot ladybird

by Richard A. Jones (8355)

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The accompanying photograph (Fig. 1) shows one of two specimens of a no-spot ladybird found by sweeping a narrow railway embankment at Barkingside on 22nd September 1999. Despite the absence of any marks, it is (of course) the common 24-spot ladybird, *Subcoccinella vigintiquatuorpuntata* (Linn.).

This very common ladybird is rather variable, but its small size (relative to other ladybirds), its domed convexity and its large number of spots mean that it is usually identified by its general appearance, its approximate pattern, rather than a careful count of its marks or analysis of its pattern. It is recognised by its "facies" as older texts might describe, its "jizz" as modern books might have it.



Figure 1. The no-spot ladybird

A spotless version of the 24-spot ladybird, lacking all the normal black marks, was nevertheless immediately identifiable as such. I thought it interesting enough to photograph and even decided to take a representative specimen.

The unspotted form of this species is not common. Fowler (1889) *The Coleoptera of the British Islands*. 3: 156-157 states that the spots are "sometimes but rarely absent". Because it is fairly uncommon, it is



perhaps more likely to be collected than typical specimens. And if there are specimens out there, they should be looked at very carefully because there is another extremely similar species waiting in the wings of Europe, which ought one day to turn up in Britain.

Cynegetis impunctata (Linn.) in its typical form, looks just like this unspotted 24-spot ladybird. It is the same size, the same shape, the same colour and has the same dull hairiness under the microscope. It is widespread in Europe, and occurs in the Channel Islands.

Unfortunately, my Barkingside ladybirds were not a beetle species new to Britain. The tarsal claws showed the deeply split two-fingered form of *Subcoccinella*, without the basal tooth of *Cynegetis*, and the elytral epipleurae (the narrow edges of the wing cases where they are folded underneath the beetle's body) were smooth, not punctured as are those of *Cynegetis*. Never mind, perhaps next time.

Acknowledgement

Thanks to Mike Majerus for bringing the British possibility of *Cynegetis impunctata* to my attention.



Greenfly problems

by Andrew Eames (4648)

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Nick Holford's "Greenfly problems" in Volume **58** illustrate a problem that has become worldwide during the last 50 years – the development of resistance by insects to pesticides. It is now a well-known and serious problem in all areas of agriculture and horticulture throughout the world.

Resistance to pesticides develops when the same- or related-pesticides are used on a regular basis. A small number of insects will eventually survive what should have been a fatal dose, and from then on there is a very rapid build-up of a resistant pest population.

The correct tactic is to use pesticides only when necessary, and when regular sprays are needed to use pesticides from unrelated chemical groups in rotation. Even then, some insect pests have become very difficult to control; most strains of aphids (greenfly) are resistant to at least some of the pesticides, and our glasshouse whitefly is resistant to many of them. Perhaps it is time for Nick to look again at biological control?



On boilers and butterflies

by *Alpha of the Plough*

submitted by *Brian Gardiner (225)*

2 Highfield Avenue, Cambridge CB4 2AL.

I went recently to an industrial town in the North on some business, and while there had occasion to meet a man who manufactured boilers and engines and machinery of all sorts. He talked to me about boilers and engines and machinery of all sorts, and I did my best to appear interested and understanding. But I was neither one nor the other. I was only bored. Boilers and engines, I know, are important things. Compared with a boiler, the finest lyric that was ever written is only a perfume on the gale. There is a practical downrightness about a boiler that makes "Drink to me only with thine eyes," or "O mistress mine, where are you roaming?" or even *Twelfth Night* itself, a mere idle frivolity. All you can say in favour of *Twelfth Night*, from the strictly business point of view, is that it doesn't wear out, and the boiler does.

But though boilers and engines are undoubtedly important things, I can never feel any enthusiasm about them. I know I ought to. I know I ought to be grateful to them for all the privileges they confer on me. How, for example, could I have gone to that distant town without the help of a boiler? How – and this was still more important – how could I hope to get away from that distant town without the help of a boiler? But gratitude will not keep pace with obligation, and the fact remains that great as my debt is to machinery, I dislike personal contact with it as much as I dislike the east wind. It gives the same feeling of arid discomfort, of mental depression, of spiritual bleakness. It has no bowels of compassion. It is power divorced from feeling and is the symbol of brute force in a world that lives or perishes by its emotional values. In Dante's *Inferno* each sinner had a hell peculiarly adapted to give him the maximum of misery. He would have reserved a machine-room for me, and there I should have wandered forlornly for ever and ever among wheels and pulleys and piston-rods and boilers, vainly trying amidst the thud and din of machinery and the nauseous reek of oily "waste" to catch those perfumes on the gale, those frivolous rhythms to which I had devoted so much of that life which should be "real and earnest" and occupied with serious things like boilers. And so it came about that as my friend talked I spiritually wilted away. I did not seem to be listening to a man. I seemed to be listening to a learned and articulate boiler.



Then something happened. I do not recall what it was; but it led from boilers to butterflies. The transition seems a little violent and inexplicable. The only connection I can see is that there is a "b" in boilers and a "b" in butterflies. But, whatever the cause, the effect was miraculous. The articulate boiler became suddenly a flaming spirit. The light of passion shone in his eyes. He no longer looked at me as if I were a fellow-boiler, but as if I were his long-lost and dearly-beloved brother. Was I interested in butterflies? Then away with boilers! Come, I must see his butterflies. And off we went as fast as petrol could whisk us to his house in the suburbs, and there in a great room, surrounded with hundreds of cases and drawers, I saw butterflies from the ends of the earth, butterflies from the forests of Brazil and butterflies from the plains of India, and butterflies from the veldt of South Africa and butterflies from the bush of Australia, all arranged in the foliage natural to their habitat to show how their scheme of coloration conformed to their setting. Some of them had their wings folded back and were indistinguishable from the leaves among which they lay. And as my friend, with growing excitement, revealed his treasure, he talked of his adventures in the pursuit of them, and of the law of natural selection and all its bearings upon the mystery of life, its survivals and its failures. This hobby of his was, in short, the key of his world. The boiler house was the prison where he did time. At the magic word "butterflies" the prison door opened, and out he sailed on the wings of passion in pursuit of the things of the mind.

There are some people who speak slightly of hobbies as if they were something childish and frivolous. But a man without a hobby is like a ship without a rudder. Life is such a tumultuous and confused affair that most of us get lost in the tangle and brushwood and get to the end of journey without ever having found a path and a sense of direction. But a hobby hits the path at once. It may be ever so trivial a thing, but it supplies what the mind needs, a disinterested enthusiasm outside the mere routine of work and play. You cannot tell where it will lead. You may begin with stamps, and find you are thinking in continents. You may collect coins, and find that the history of man is written on them. You may begin with bees, and end with the science of life. Ruskin began with pictures and found they led to economics and everything else. For as every road was said to lead to Rome, so every hobby leads out into the universe, and supplies us with a compass for the adventure. It saves us from humiliation of being merely smatterers. We cannot help being smatterers in general, for the world is too full of things to permit is to be anything else, but one field of intensive culture will give even our smattering a respectable foundation.



It will do more. It will save our smattering from folly. No man who knows even one subject well will ever be quite such a fool as he might be when he comes to subjects he does not know. He will know he does not know them and that is the beginning of wisdom. He will have a scale of measurement which will enable him to take soundings in strange waters. He will have, above all, an attachment to life which will make him at home in the world. Most of us need some such anchorage. We are plunged into this bewildering whirlpool of consciousness to be the sport of circumstance. We have in us the genius of speculation, but the further our speculations penetrate the profounder becomes the mystery that baffles us. We are caught in the toils of affections that crumble to dust, indoctrinated with creeds that wither like grass, beaten about by storms that shatter our stoutest battlements like spray blown upon the wind. In the end, we suspect that we are little more than dreams within a dream – or as Carlyle puts it, “exhalations that are and then are not.” And we share the poet’s sense of exile –

In this house with starry dome,
Floored with gem-like lakes and seas,
Shall I never be at home?
Never wholly at my ease?

From this spiritual loneliness there are various ways of escape, from stoicism to hedonism, but one of the most rational and kindly is the hobby. It brings us back from the perplexing conundrum of life to things that we can see and grasp and live with cheerfully and companionably and without fear of bereavement or disillusion. We cultivate our garden and find in it a modest answer to our questions. We see the seasons come and go like old friends whose visits may be fleeting, but are always renewed. Or we make friends in books, and live in easy comradeship with Horace or Pepys or Johnson in some static past that is untouched by the sense of the mortality of things. Or we find in music or art a garden of the mind, self-contained and self-sufficing, in which the anarchy of intractable circumstance is subdued to an inner harmony that calms the spirit and endows it with more sovereign vision. The old gentleman in *Romany Rye*, you will remember, found his deliverance in studying Chinese. His bereavement had left him without God and without hope in the world, without any refuge except the pitiful contemplation of the things that reminded him of his sorrow. One day he sat gazing vacantly before him, when his eye fell upon some strange marks on a teapot, and he thought he heard a voice say, “The marks! the marks! cling to the marks! or –”. And from this beginning – but the story is too fruity, too rich with the vintage of



Borrow to be mutilated. Take the book down, turn to the episode, and thank me for sending you again into the enchanted Borroviaan realm that is so unlike anything else to be found in books. It is enough for the purpose here to recall this perfect example of the healing power of the hobby. It gives us an intelligible little world of our own where we can be at ease, and from whose warmth and friendliness we can look out on the vast conundrum without expecting an answer or being much troubled because we do not get one. Perhaps it was a hobby that Pascal needed to allay that horror of the universe which he expressed in the desolating phrase, "Le silence éternel de ces espaces infinis m'effraie." For on the wings of the butterfly one cannot only outrange the boiler, but can adventure into the infinite on the spirit of happy and confident adventure.



Hibernating Stag beetles

by John Bocock (4211)

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During the course of a garden reconstruction two adult stag beetles (one male and one female) were found alive and in good condition. This was in mid-November. They were removed and placed along with soil/leaf mould mixture in a large plastic sweet jar which was in turn covered with dead vegetation.

Early in January the jar was found broken open and the stag beetles missing. A possible explanation was that this was the work of a fox. Several questions arise. Is hibernation a feature of the stag beetle life cycle and if so what percentage might be expected to survive the winter and even go on to breed? How might a fox detect a dormant stag beetle through a sealed plastic jar, assuming no odour or movement? Do foxes consider adult stag beetles something of a delicacy or food in the absence of more nourishing fare?

If anyone has had successful experience in the rearing and breeding of stag beetles I would be interested to hear from them, especially regarding preferred tree species, their associated rot producing fungi and the construction of suitable habitats for larvae.



Book Review

Zoological Catalogue of Australia

by W.K.K. Houston and A. Wells (1988) (eds). Vol. 23. Archaeognatha, Zygentoma, Blattodea, Isoptera, Mantodea, Dermaptera, Phasmatodea, Embioptera, Zoraptera. Melbourne: CSIRO Publishing, Australia. xiii 464 pp (ISBN 0643 06035 9). Available from CSIRO Publishing, PO Box 1139, Collingwood, Victoria, Australia 3066. Price \$120 + \$8 postage (air) – Australian and New Zealand customers pay \$A, in all other countries prices are in \$US.

This volume is written by specialists and is part of a uniform series detailing taxonomic and biological knowledge of the Australian fauna. Volume 23 covers nine insect orders, namely the Bristletails, Silverfish, Cockroaches, Termites, Mantids, Earwigs, Stick and Leaf-insects, Web-spinners and the little known Zoraptera. In addition to book form, the information is also used by CSIRO as a public information database.

This work will be of particular interest to the taxonomist, as it provides bibliographic references to genera, species and synonyms. Brief distribution and ecology notes are included for each species, following general introductory notes to each order and family. References are given, and indices to species and genera for each order.

As a specialist in phasmids, I comment on that section (Balderson, J., Rentz, D.C.F. & Roach, A.M.E. Phasmatodea – pp. 347-378, 402, 451-456), which I have used as a research tool since obtaining a copy of the proofs in early 1995. Publication has been eagerly awaited and, consequently, information is occasionally out of date, following research since 1995. For instance, *Staelonchodes* has become a synonym of *Lonchodes*, and *Ctenomorpha marginipennis* was recently found to have priority over *Ctenomorpha chronis*. The taxonomy of the fascinating Australian phasmid fauna is confusing, with some historic species hardly known at all and this publication will help researchers in quickly locating key references. Caution needs to be exercised when studying species, as the authors outline in the introduction. I can verify



this first hand, as I recently transferred a species listed as a synonym of an unrelated species, to the genus *Eurycnema*; it was only by rearing the insect that I was able to establish that the type specimen (a nymph) was a valid species – *Eurycnema osiris* (Gray).

Although the phasmid section is an update of a useful listing by Vickery in 1983, there was one mystery repeated from that paper, which I recently came across. *Parasipylloidea granulosa* (Brunner) was described as *Menexenus granulosa* on p. 245 of Brunner (1907), not as *Hyrtacus granulosa*, p. 301. A few spelling errors have arisen (although correct in Vickery), as follows: p. 352 *Haaniella grayi* (should be *grayii*), p. 365 *Ctenomorpha salmacris* (should be *salmacis*) and p. 375 *Tropidoderus childreni* (should be *childrenii*) – in some cases errors may have resulted from reliance on a recent unpublished listing of phasmids. Both this catalogue and Vickery list *Eurycnema sternocerca* instead of *E. sternocerca*. This species and *Eurycnema cercata* (described by Redtenbacher in 1902, not 1908) are both synonyms of *E. osiris*. The Asian taxa originally linked with *Eurycnema goliath* by Vickery (repeated in this work), represent a distinct species. Recent checks of museum collections by specialists have uncovered further information e.g. on the number of type specimens(s), unfortunately too late to include in this work, but will be published in a worldwide listing of phasmids in due course.

This volume is a valuable listing, which researchers of the Australian fauna will wish to own, or refer to in an entomological library. Updates to the information provided can, of course, easily be made to the database to assist future researchers. It is only recently that taxonomic work has been undertaken on the Australian phasmid fauna (there have only been three species described since 1920, although I estimate that there are over 200 Australian species present in museum and private collections, against the 104 described in this volume plus some descriptions in press). It is to be hoped that researchers will be inspired by this fine volume to undertake serious research work.

Paul D. Brock (4792)

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of the Amateur Entomologists' Society

Volume 59 • Number 430

June 2000

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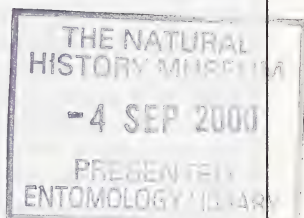
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The cover of the *Bulletin* features the eggs of the Lily Beetle, *Lilioceris lili*.

The eggs are sausage-shaped and bright red in colour. They are laid in small clusters on the undersides of the leaves of lilies (*Lilium* spp) and Snakeshead Fritillary (*Fritillaria meleagris*). The female may lay 200-300 eggs over a period of several months. The larvae emerge about ten days after the eggs are laid. The eggs are about 1mm tall.

Photo: Nick Holford.

The Bulletin

of the Amateur Entomologists' Society

Volume 59 • Number 431

August 2000

Editorial

This is the last *Bulletin* before the Annual Exhibition and is therefore our last chance to remind you of the date – Saturday 7th October at Kempton Park Racecourse (for full details see the adverts at the rear of the *Bulletin*). As usual we would be grateful of any help that members can give during the day, either with setting up from 6am or stewarding during the day. If you can help please contact me at the Society address, e-mail or phone (07788 163951 messages).

The event is beginning to get well booked and we are looking forward to an even larger event than last year. There is still time to book either as a trader or as an exhibitor – all you need to do is complete and return the enclosed application form enclosed with this or the June *Bulletin*. One thing that all members can do is to help us to publicise the event (particularly those in the local area) and if you know of any newspapers etc that may be interested in featuring the event please let us know as soon as possible.

Finally on the exhibition front we remind you of the Wants and Exchange table for members to sell their surplus stock and unwanted equipment. All for a commission of only 10%. If you have anything to sell or just want to get rid of – bring it along and we will see what we can do for you! It may even be possible to collect items if they are in the area of a Council member.

We have also just set up a new service for members on our internet site. A new discussion group, solely for AES members allows you to discuss items entomological, obtain identifications and exchange livestock. To access this new group, log on to the website at <http://www.theaes.org> and follow the links!

I hope to see you at the exhibition in October – please say hello (if you can catch me!)

Wayne





Saturday 2nd October 1999 – The Annual Exhibition : A report

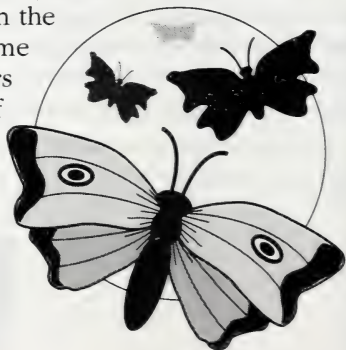
The day started dark and damp at 6am when we arrived at the halls at Kempton Park racecourse to set up the huge exhibition which was due to open in only a few hours. A new feature of the 1999 event was the use of both large halls – causing a nightmare in terms of arranging the tables before dealers began to arrive. As ever we were supported by a loyal band of volunteers, without whom the exhibition could not function, and the halls were soon ready to begin the setup.

The queue started even earlier than usual this year and at opening time at 11am stretched for as far as could be seen. It took our gate staff a good 40 minutes to whittle away the queue such were the numbers wishing to attend. Also in attendance were television crews for the first time in a number of years, from ITV and BBC News24, and also BBC Southern Counties radio were in attendance, broadcasting live to their Saturday morning show. This undoubtedly helped admission figures which were just under 2000.

The number of exhibits remained at a disappointing low, but thanks are expressed to those who took the time and trouble to prepare an exhibit, which still is an important part of the event. It really doesn't matter how large or small the exhibit is – it usually has an interest to someone! The Ansorge Award was given to Philip Crisp for his exhibit and competition was quite fierce – the first time for a number of years!

Reports received from some of those that exhibited are given at the end of this introduction. We hope that you will be tempted to exhibit this year on 7th October – all you need to do is book your space on the form included with this or the June *Bulletin*. We would also be welcome of any assistance that can be given during the day, especially in setting up in the morning or via stewarding during some part of the day. We reward all helpers with a visit to the local hostelry – so if you can help please get in touch.

We hope to see you at this years exhibition.



**Exhibit by Keith C. Lewis 3689**

Information, photograph and map concerning the Longhorn beetle *Anoplophora glabripennis* (Motschulsky) 1853 Cerambycidae: Lamiinae.

The Asian Longhorn, common name Starry-Sky-Beetle. Original distribution China, Manchuria, Korea and Japan. And its infestation of trees at Greenpoint, Brooklyn, in the United States and its appearance at Dent in Cumbria, United Kingdom, in a consignment of floor tile packing cases imported from China possibly contaminated from Poplar wood used for ship dunnage.

Chris Gardiner (5249)

Glow-worm photography

The display shows photographs of female Glow-worms (*Lampyrus noctiluca*) taken at Barnack Hills & Holes NNR, Cambridgeshire, in July this year.

There are many problems associated with photographing these Insects:

Exposure – this was arrived at by trial and error. There was virtually no ambient light by “lighting up” time at about 20.30 hrs, so exposure times of two minutes or more were needed. An over-long exposure leads to increasing areas of the image being bathed in a green mist and loss of definition of the subject itself. A fast film (800 or even 1600) helped in this respect.

Focus – Shots had to be set up with the help of a torch, but the insects moved about and also had a habit of swaying from side to side. Long exposures also meant that wind caused problems unless the insect was in deep shelter.

Flash photography – seemed to defeat the object of the exercise as the “glow” itself was lost. No doubt better results could be obtained with a more muted flash. In this example, focus was also lost but this seems to have been due to movement caused by a male, which can just be seen in attendance.

Andrew Halstead (6346)

Marsh frogs on the move

RHS Garden, Wisley, Woking, Surrey GU23 6QB

The marsh frog (*Rana ridibunda* Pallas) has been in Britain as an introduction for about 100 years. Its main stronghold since the 1930s



has been the Romney Marshes in Kent but during the 1990s it has become much more widespread in Surrey. It was first recorded at the Royal Horticultural Society's Garden at Wisley, Surrey in May 1992. Unlike the native common frog, which breeds for a short period in late February or early March, the marsh frog breeds in mid-summer. The males call on sunny days throughout May to August and produce a loud noise that sounds like a quacking donkey. The cheeks are puffed out to the point of bursting when this noise is being produced.

The specimen shown here is an immature marsh frog. The adults are two to three times the size of a common frog and have a dull green colouration. As befits a large frog, the marsh frog has a big appetite. Examinations of gut contents have shown that marsh frogs feed both on land and in the water. They consume a wide range of insects and other invertebrate animals, other amphibians, nestling birds, small rodents and fish up to 7cm long! Their presence in gardens and on nature reserves, such as Wisley Common SSSI, must be having some impact on the fauna.

The reason for the recent spread of the marsh frog is unclear but it may be related to the run of hot summers that have occurred during the present decade. This may have increased the breeding success of marsh frogs, with the adult frogs having to disperse to find breeding territories.

Roy McCormick – Exhibit 1999

Interesting species that have been seen in Devon during 1999.

The species shown are not necessarily those seen or taken but are a representation of the ongoing work that is being carried out in the county. Vouchers are in existence for all of these species.

0174 *Heterogenea asella* D.& S

Two specimens of this were taken at Great Torrington on 26.6.1999 and a few days later; the first being held by Dr.B.P.Henwood with the second in the collection of Dr. A.Henderson. The last time it was recorded in Devon was prior to 1906. The specimen shown is a representative.

1314 *Catoptria margaritella* D.& S.

This specimen represents a record at Belstone, Okehampton on 2.8.1999 by C.Penney; the species has been seen at several sites in the Dartmoor area.



- 1348 *Parapoynx stratiotata* Linn. Ringed China-mark
The specimen shown was taken at Slapton on 11.9.1999 and was one of five seen; the species has been seen at Slapton a number of times and has also been found at other reed-bed sites in VC3.
- 1374A *Sclerocona acutellus* Eversmann
Shown are two of the specimens taken in Exeter by P. Butter and me; these represent the fourth and fifth British records. A further four specimens were taken on 5.7.1999. The damage to the specimens occurred during to setting process.
- 1434 *Cryptoblates gnidiella* Mill.
Two pomegranates were purchased at my local greengrocer on 6.9.1999 and they were infested with larvae of this species; two of the resultant moths are shown; one of these from last year.
- 1676 *Cyclophora annularia* Eabr. The Mocha
Shown are two specimens bred from a female taken at All Hallows School in 1998 (the school has now closed). One of these which emerged on 25.6.99 has the central band a lot wider than normal; the specimen is also a slight cripple.
- 1790 *Triphosa dubitata* Linn
The specimen shown represents an example taken by B.Skinner at Berry Head on 31.7.1999; it was retained by Barry Henwood. There have been only three sightings of the species from VC3 and VC4 since 1980.
- 1292 *Calamotropha paludella* Hb.
This specimen was taken at Newton Abbot on 9.7.1999 and is only the third record for the county.
- 1343 *Eudonia delunella* Hb
This has been seen at several locations in VC3 and VC4 during 1999; the ones shown are from Great Torrington and Teignmouth.
- 1370 *Sitochroa palealis* D. & S.
The specimens shown are representative of two seen at Hopes Nose, Torquay on 8.7.1999.
- 1402 *Diasema reticularis* Linn.
The specimen was taken by Dr. A. Henderson at Bideford and is exhibited by him.
- 1460 *Ectomyelois ceratoniae* Zell. Locust Bean Moth



- 1714 *Idaea degeneraria* Hb. Portland Ribbon Wave.
This specimen was taken at Slapton on 11.9.1999; being a female, I tried to breed from it but it died after being kept for a week. B. Skinner considers this to be a migrant similar to others shown in the latest edition of his book. The last recorded sighting was 1927 at Anstey's Cove, Torquay.
- 1872 *Discoloxia blomeri* Curt. Blomer's Rivulet
The specimen shown is from Buckfastleigh on 16.7.1999; this is a new site for the species in Devon. Locations since 1980 twelve.
- 1972 *Agrius convolvuli* Linn. Convolvulus Hawk
The specimen shown represents a number that have been seen in Devon in 1999; notably Bideford; Lydford and Tavistock.
- 1996 *Furcula bicuspis* Borkh. Alder Kitten
This specimen was taken at Buckfastleigh on 22.5.99. The species has been seen at 19 sites in VC3 and VC4 since 1980.
- 2019 *Clostera curtula* Linn. Chocolate Tip
This specimen is a new record for my garden in Teignmouth; taken on 27.7.1999; the species has now been seen at 21 sites in VC3 and VC4 since 1980.
- 2035 *Thumantha senex* Hb. Round Wing Muslin
This specimen taken at Newton Abbot Racecourse on 9.7.1999, which is a new location for the species; I have 7 sites in VC3 since 1980.
- 2140 *Cerastis leucographa* D. & S
White marked specimens were taken near Great Torrington on 8.4.1999; included among these was a female which laid eggs which are being bred through. The male shown is one of the specimens taken. Two were taken at Bideford on 1.4.1999 with a further specimen near Tiverton (VC4) around the same time.
- 2260 *Conistra rubiginea* D. & S. Dotted Chestnut
The specimen shown represents a specimen seen at Orley Common, Ipplepen on 9.4.1999. There have been several sightings of the species over the years, mostly from VC3 on the heaths. A few were bred from a female taken at Stover Park in 1997 with most of these being released back.
- 2334 *Apamea sordens* Hufn. Rustic Shoulder-knot
The two specimens shown are from my garden in Teignmouth on 17.6.1999 and Okehampton on 26.5.1999; the species surprisingly, is not common in Devon, with most of the sightings from VC3.



- 1984 *Macroglossum stellatarum* Linn. Humming-bird Hawk.
The specimen shown represents specimens seen but not taken from Prawle Point in May 1999 and Teignmouth on 20.9.1999
- 2005 *Peridea anceps* Goeze. Great Prominent
This specimen is a new record for my garden in Teignmouth; taken on 26.4.1999. The species is widespread in woodland.
- 2028 *Calliteara pudibunda* Linn. Pale Tussock
This, unusual for Devon, dark specimen was taken in my garden at Teignmouth on 30.4.1999
- 2076 *Meganola albula* D.& S. Kent Black Arches.
The specimens shown represent three specimens that were seen on Hopes Nose on 8.7.1999; the main site for this species in Devon is Dawlish Warren but specimens have been seen at other locations in VC3.
- 2159 *Lacanobia suasa* D.& S. Dog's Tooth
Two specimens were seen at Newton Abbot Racecourse on 9.7.1999 with one being taken, the specimen shown. There are precious few records in Devon, all from VC3 on saltings and marshy places.
- 2277 *Moma alpium* Osb. Scarce Merveille-du-Jour
From the discovery of the species near Great Torrington in 1998, the Field Meeting to the area on 26.6.1999 extended our knowledge of the extent of the site where it lived. The female shown laid 150 eggs which all hatched; these were distributed with a good number put back to Great Torrington.
- 2391 *Chilodes maritimus* Tausch. Silky Wainscot
This specimen was taken in my garden at Teignmouth a good distance away from reed beds, on 1.8.1999. The species is common in the reed beds of Dawlish Warren, Exminster Marshes and Slapton plus other sites in VC3.
- 2403 *Heliothis peltigera* H.&S. Bordered Straw
Only two specimens recorded, one on 30.5.1999, and the other from near Tavistock around the same time. Specimen shown is a representative.
- 2404 *Heliothis nubigera* H.&S. Eastern Bordered Straw
Karl Bailey took a specimen of this on his kitchen window on 5.1.1999; this is the first record for Devon and the fourth British record. The specimen is exhibited by Mr Bailey.



- 2407 *Eublemma ostrina* Hb. Purple Marbled
The first specimen shown was taken at Hopes Nose on 12.6.1999, the other specimen was taken as a larvae by Bob Heckford at Strete Gate Beach in early August, where several were found. I bred the specimen through. A larva was also found at Beer by myself, again in early August but this was parasitised.

Specimens from my holiday in Ireland

- 1551 *Pieris napi* Linn. ssp. *britannica* Ver. Green-veined White
The species was seen in Co.Clare and Kerry; these two taken on The Burren, Co.Clare in the middle of August 1999.
- 1626 *Maniola jurtina* Linn. ssp. *iernes* Graves. Meadow Brown
These were seen at several places but were found in good condition at Fanore sand dunes, Co.Clare. Taken in the middle of August 1999.
- 1967 *Aspitates gilvaria* D.& S. ssp. *burrenensis* Cock. Straw Belle
Seen at Ballyvaughan and Kilhinaboy, The Burren, Co.Clare, on 16th and 18th August 1999.
- 2231 *Aporophyla lutulenta* D.& S. ssp. *lueneburgensis* Freyer.
Northern Deep-brown Dart
These two taken at Ballyvaughan, The Burren, Co. Clare in the middle of August 1999; only three were seen, all males.
- 2354 *Luperina nickerlII* Freyer. ssp. *knilli* Bours. Sandhill Rustic
Shown are a pair from Inch, Dingle, Kerry taken on 21.8.1999, and a pair from Sleah Head, Dingle, Kerry taken on 22.8.1999.
- 1621 *Melanargia semele* Linn. ssp. *clarensis* Lattin. W. Ireland Co. Clare.
The Graying
These were seen in several places on The Burren, Co. Clare; this pair taken in the middle of August 1999.
- 1867 *Aplocera plagiata* Linn. ssp. *scotica* Rich. Treble Bar
The species, although from Ireland, is identical with the Scottish subspecies; these were taken in the middle of August 1999 on The Burren, Co. Clare.
- 2198 *Mythimna impura* Hb. f. *scotica* Cock. Smoky Wainscot
Another species that is identical with the Scottish form; the only one seen on 18.8.1999, at Ballyvaughan, The Burren, Co. Clare.
- 2303 *Thalpopbila matura* Hufn. Straw Underwing
Alan Jenkins took a number of this variety at Sleah Head, Dingle, Kerry on 18.8.1999; this specimen with the pale area in the middle of the forewing taken on 22.8.1999 at the same site.



- 2366 *Calamia tridens* Hufn. Burren Green
Seen at several sites on The Burren, Co. Clare; the pair shown were taken on 16.8.1999 from Killinaboy. The species flies after 2a.m. but can be seen after emergence sitting on the grasses.
- 2367 *Celaena haworthii* Curt. Haworth's Minor
This specimen taken on the edge of a field at my second B. & B. near Killorglin, Kerry on 25.8.1999; it is a lighter colour than the English ones.

Bred species from Cambridgeshire with a possible N.C.R

- 2316 *Cosmia affinis* Linn. Lesser-spotted Pinion
- 2317 *Cosmia diffinis* Linn. White-spotted Pinion
- 2319 *Cosmia pyralina* D.& S. Lunar-spotted Pinion

These three species above were bred from larvae that were beaten from elm and wych elm on 22.5.1999, which was a little late for the *C. pyralina* as they were fully grown and spun up almost immediately; the other two were around half grown. The *pyralina* and *affinis* emerged in June with the *diffinis* coming out in July. The site was visited on 5.8.1999, and one *pyralina*, a very worn one, and one *diffinis*, a perfect one (which escaped) came to light. The date was probably early.

- 1841 *Eupithecia millifoliata* Ross. Yarrow Pug
One of these was identified when I arrived home, taken on 5.8.1999 in Cambridgeshire. This is not listed in the Victoria County History of that county. Is this a new county record?

P.J.B.

Melanism in the British Geometridae

Many British species of the Geometridae can display melanism to a greater or lesser extent. This exhibit shows some examples of this characteristic with, in all cases, a "typical" specimen for comparison.

Idaea seriata – Small Dusty Wave
West Hill 17.vii.96. Not uncommon in East Devon.

Idaea aversata – Riband Wave
Thorpe 24.vii.91.

Xanthorhoe fluctuata ssp. *thules* – Garden Carpet
Feshie Bridge 5.vii.99. A Scottish speciality.

Chloroclysta truncata – Common Marbled Carpet
New Forest 6.vi.76. Not too common in this species.



Thera obeliscata – Grey Pine Carpet

Pinner 1.vii.64., Arelsford 27.v.73. Full melanics not seen too often.

Electrophaes corylata – Broken Barred Carpet

Feshie Bridge 8.vi.92. A Scottish form, where a typical specimen has a lighter background than southern examples.

Apocheima hispidaria – Small Brindled Beauty

Ranmore 9.iii.71. Shows a full range of gradation to the typical form.

Apocheima pilosaria – Pale Brindled Beauty

Thorpe 30.1.90. Best bred to get good cabinet specimens.

Agriopis leucophaeria – Spring Usher

Ashted 26.v.13. Melanic forms of any of the many "types" can be found uncommonly.

Agriopis marginaria – Dotted Border

Broxbourne 25.v.89. (larva). Suffused darker forms much commoner than full melanics.

Agriopis defoliaria – Mottled Umber

Thorpe 20.x.73. Melanics not a common component of the range of variation of this species.

Peribatodes rhomboidaria – Willow Beauty

Beeley Moor 17.v.18. Perhaps commoner in the once industrial North. Best bred.

Odontopera bidentata – Scalloped Hazel

Pinner 18.v.64. Not uncommon in the London area.

Deileptenia ribeata – Satin Beauty

Box Hill 30.iv.16. The regular form from yew on Box Hill. Even bred specimens are usually rubbed.

Paradarisa consonaria – Square Spot

Tintern 24.v.18. Part of the wide range of variation normally found in this locality.

Menophra abruptaria – Waved Umber

Pinner 10.v.64. Once widespread in London area, now much more localised.

Plemyria rubiginata – ssp. *plumbata* Blue Bordered Carpet

Feshie Bridge 30.vii.99. This ab. *funiosa* is not uncommon in this Scottish subspecies where the central forewing band may be more or less entire.

Cabera exanthemata – Common Wave

Studland 6.viii.76. This insect is a beautiful dark dove grey colour when fresh.

**Roger Kemp (3152) – brought by Roy McCormack**

Roger Kemp, Kemp's Farm, Chapel Road, Ford, Aylesbury, Bucks.

Belize butterflies – 3rd BENHS Expedition (4-20 Dec. 1998)

A – Deep forest species

Colobura dirce

Nessaea aglaura

Tigridia acesta

B – Forest ride & edge species

Hamadryas feronia

Euptychia libye

Chlosyne gaudealis

Heliconius erato

Melanis pixie

Heliconius doris

Aeria eurimedia (Ithomiinae)

Heliconius charitoni

Macrosoma semiermis (Hedylidae) + *Arawacus mexicana*

C – Mimicry complex (1)

Heliconius ismenius (Heliconiinae)

Lycorea cleobaea (Danainae)

Tithorea harmonia (Ithomiinae)

Mechanitis lysimnia (Ithomiinae)

Mechanitis polymnia (Ithomiinae)

Eueides isabella (Heliconiinae)

Dismorphia amphiona (Pierinae)

Hypothyris lycaste (Ithomiinae)

D – Mimicry complex (2)

Parides arcas

Parides sesostris

Parides polyzelus

Archonius tereas (Pierinae)

E – Mimicry complex (3)

Oleria paula

Pteronymia cotyto

Moth mimic

Moth mimic

F – Open ground species

Phoebis argante

Aphrissa boisduvalii

Siderone marthesia

Libytheana carinenta

Eueides aliphera

Eurema gratio

Eurema daira



Roger Kemp (3152)

Anthocaris cardamines gynandromorph

Found – 9.30am 3rd may 1999, Ford village, nr. Aylesbury, Bucks

One specimen was displayed on his stand, NOT with the Members' Exhibits, though it was submitted as a Member's Exhibit.

Other Exhibits

Some European Burnets

These insects were collected during trips to Provence (April 1992), Pyrenees (1989 and 1993), SW Alps (1997) and Burren, Eire (1990).

1. *Adscita statice* Forester. Andorra. 23.7.93
2. *Zygaena occitanica occitanica* Gurr, Catalonia 25.7.97
3. *Zygaena occitanica occitanica* Gurr, Catalonia 25.7.97
4. *Zygaena bilis onondis* SW Alps, France 29.7.97
5. *Zygaena bilis onondis* SW Alps, France 29.7.97
6. *Zygaena bilis galliae* Gurr, Catalonia 23.7.93
7. *Zygaena bilis galliae* Gurr, Catalonia 2.7.93
8. *Zygaena filipendulae filipendulae* SW Alps France 27.7.97
9. *Zygaena filipendulae ligurica* Catalonia 24.7.93
10. *Zygaena loti* Slender Scotch Burnet 21.7.93. Central Pyrenees 1200m
11. *Zygaena exulans* Scotch Burnet SW Alps France 2200m 30.7.97
12. *Zygaena lavandulae lavandulae* 28.4.92 Provence
13. *Z. lavandulae lavandulae* 28.4.92 Provence
14. *Z. lavandulae consobrina* 3.6.89 E Pyrenean hills
15. *Zygaena rhodamanthus rhodamanthus* 28.4.92. Provence France
16. *Zygaena rh. rhodamanthus* 28.4.92. Provence France
17. *Zygaena sarpedon* 24.7.97 1200m Catalonia
18. *Zygaena purpuraria parvalpina* 14.7.93. Central Massif France
19. *Zygaena purpuraria sabulosa* 2.7.90. Burren. Co. Clare, Eire

North Devonshire Moths 1997 to 1999

Moving to North Devon in 1997 from Wales brought new experiences in entomology. A well-organised Devon Moth Group led by Roy McCormick made entomology a sociable study for the first time in my life. However North Devon still remains comparatively under recorded and the oakwoods and coastline in particular are very valuable and rewarding habitats.



Following the rediscovery of a breeding colony of *alpium*, Scarce Merveille-du-jour in July 1998, I invested in the purchase of a 5 acre oakwood on the banks of the river Torridge designated as ancient semi-natural woodland by English Nature. This wood comprises oak on an acid slope with heather and bilberry undergrowth and an alluvial floodplain base rich comprising mainly ash and alder with a rich floral understorey. The first Triangle recorded in Devon for many years was recorded close to the wood and identified by Barry Henwood and Roy McCormick.

The moths exhibited illustrate species recorded from the Torridge wood at Blinsham and from my garden and coastal localities in North Devon.

1. *Heterogenea asella* Triangle. The second specimen at Blinsham 9.7.99
2. *Agrius convolvuli* Convolvulus Hawk 11.9.99, 20.9.99 Littleham
3. *Xanthia citrargo* Orange sallow 6.9.99 Littleham
4. *Zeuzera pyrina* Leopard. 9.7.99 but regular in Devon
5. *Lithosia quadra* Female of this species recorded at Abbotsham 12.7.97 (male exhibited)
6. *Moma alpium* Scarce Merveille-du-Jour. First breeding colony in Devon this century Blinsham. 26.6.99
7. *Sesia bembeciformis* Lunar Hornet Clearwing 26.6.98 ex larva Bursdon
8. *Eilema caniola* Hoary footman 5.8.98 Westward Ho
9. Waiscot species? 5.8.97 Littleham
10. *Trichiura crataegi* Pale eggar. Common at Blinsham 23.8.98
11. *Agrotis trux* Crescent dart 28.7.97 WWHo Also Littleham
12. *Lygephila cracca* Scarce blackneck 7.6.98 ex larvae Bucks Mills
13. *Cerastis leucographa* White marked 4.4.99 Littleham
14. *Phyctaenia stachydalis* 26.6.99 Blinsham but also at Littleham
15. *E. venosata venosata* Netted pug 12.5.98 Westward Ho
16. *Mythimna putrescens* Devonshire wainscot 5.8.98 Hartland Point
17. *Parapoynx stratiotata* 30.7.99 Littleham
18. *Hydrelia sylvata* Waved carpet 9.7.99 Blinsham
19. *Polymixis xanthomista* Blackbanded 16.8.97 WWHo Male and female
20. *Ebulea crocealis* 9.7.98 Abbotsham
21. *Angerona prunaria* Orange moth f. *corylaria* 4.6.99 ex larva Blinsham
22. *Eumichtis lichenea* Feathered ranunculus ? f. *scillonea* 28.9.97 Abbotsham
23. *Udea ferrugalis* 13.8.99 Littleham
24. *Alcis jubata* Dotted carpet 9.7.99 Blinsham
25. *Diasemia reticularis* Rare -migrant 30.7.99 Littleham



Some European Alpine butterflies

The exhibit represents specimens collected mainly during two summer trips to The Mountains of SW Europe. The first trip in July 1993 took me to the French and Spanish Pyrenees thence home via The Picos of Northern Spain. The second trip in July 1997 was to the French Alps east of Grenoble. In addition the Spring Ringlet *E. epistygne* was located in the Mountains of Provence in April 1992 and a Scottish trip in July 1991 accounts for *epiphron* (Scottish form) and *artaxerxes*.

1. *Parnassius apollo* Picos d'Europa, Spain 28.7.93
2. *Parnassius mnemosyne* Clouded apollo 28.7.97 2000m Southern Alps France
3. *Colias phicomone*. Mountain clouded yellow 23.7.93 Andorra 2000m
4. *Boloria pales*. Shepherds fritillary 20.7.93. Spanish Pyrenees. Widespread over 1500m Male and female.
5. *Proclossiana eunomia*. Bog fritillary 22.7.93. Very localised in Pyrenees. Andorra Male and female.
6. *Hypodryas cynthia*. Cynthia's fritillary This is the *alpicola* subspecies from SW alps. Col de Galiber 2000m.
7. *Plebicula dorylas*. Turquoise blue 20.7.93. Benasque Valley N Spain. Both sexes represented. Widespread in mountains of Pyrenees.
8. *Polyommatus eros*. Eros blue 19.7.93. Spanish Pyrenees -Benasque Valley
9. *Aricia artaxerxes*. Mountain argus. British sub.sp artaxerxes. 6.7.91 Invernes-shire.
10. *Pseudaricia nicias* Silvery argus 27.7.97 2200m SW Alps.
12. *Albulinia orbitulus*. Alpine argus. Col de Galiber 2500m. 30.7.97
12. *Agriades glandon*. Glandon blue Col de Galiber 2200m 30.7.97.
13. *Erebia epiphron*. Mountain ringlet Scottish race 4.7.9 Ben Lawers Perthshire Alpine race. 20.7.93 Benasque Valley, Spain.
14. *Erebia epistygne*. Spring ringlet La Baume, Provence 5.4.92.
15. *Erebia cassioides*. Spanish brassy ringlet 19.7.93. Common Spanish Pyrenees.
16. *Erebia meolans*. Piedmont ringlet 20.7.93. Common over 1500m Pyrenees.
17. *Erebia palanca*. Chapmans ringlet. Largest *erebia* sp in Europe. Confined to NW Spain Picos d'Europa 28.7.93
18. *Coenonympha gardetta*. Alpine heath 30.7.97 SW Alps 1800m



A twenty-year survey

Macro-moths and butterflies seen in my Slough garden since October 1977, including detailed weekly records for 1997 and some comparisons with 1991 and 1998

by Roger Hayward (2769)

16 Gilmore Close, Langley, Slough, Berkshire SL3 7BD.

This survey was originally intended to end at 31st December 1997, but many events have conspired to delay its completion for so long that the temptation to include a glance or two at 1998 has proved irresistible. Including 1998 additions the total number of species of butterflies and macro-moths recorded within a three-mile radius of my home since October 1977 now stands at 414 (24 + 390 (with an additional clearwing as yet unconfirmed)), of which no less than 348 (22 + 326) have appeared in my garden. Of that 348, the surprisingly high figure of 50 (4 + 46) have not yet appeared at other sites within that three mile radius, which embraces other regularly-worked sites.

In the hope of adding interest, data from the survey of 1991 records published in the *Bulletin* for August 1992, April 1993 and June 1993 have been re-used to enable a comparison to be drawn between an above average season (1997) and what was, here at least, a poor one (1991). Two amendments to that earlier survey are offered: *E. inturbata* (Maple pug), an additional species, should be added for 2nd August 1991; *M. didyma* (Remm's rustic) was found by genitalia examination to have been present on at least 9th, 16th and 17th August 1991.

The moth records are presented in the sequence and style of Bradley and Fletcher 1979, with amendments by Agassiz 1987, except that the butterfly survey appears in less detail at the end. The style of colloquial names follows suit, and indeed follows also South, Heath and Skinner, as I much prefer the traditional presentation to the modern and hopefully passing fad of uncapitalised names.

The detailed records for 1997 are presented on week-ending Sunday basis, with a note of the number of nights in each week that the Robinson 125 watt trap was run, and the number of nights in the week that each species appeared. The information is therefore more compact than in the 1991 survey. Unlike 1991, no use was made in my garden of a Heath trap in 1997. Unfortunately, a few specific dates for very early records of singletons which were not retained as voucher specimens, eg *A. grossulariata* (the Magpie), have been mislaid.



To avoid repeating details in the earlier survey I will condense the description of the trapping site. Suffice to say that, to avoid disturbing neighbours, the trap is run against a west-facing wall, where it overlooks a few acres of convent school playing fields and rough grounds, the latter let mainly to grazing. It continues to be the case that many of the better moths settle on the wall adjacent to the trap and this is always checked just before midnight on weekdays and prior to 1 a.m. at weekends. The view from our garden, and therefore the outlook for the trap, is obscured by a hedge of sucker elm, kept trimmed to about six feet in height. Other adjacent trees include an oak about 40-50 feet high immediately outside the garden and close to the trap site. Sallow is almost absent from this area. Unfortunately, the same cannot be said for cypress hedges. Local domestic gardens offer little to insects, being mainly to lawn, with the usual decorative plants. As far as I can tell, no-one around here grows vegetables and I am probably the only person within range of the trap who grows fruit. A section of the Grand Union Canal is about 500 yards to the north, which may account for some otherwise unexpected records.

Since we moved here in late 1977 a number of changes to the local environment within some 500 yards have taken place, all resulting in the loss of rough ground and none to the benefit of wildlife. A damp wild area of an acre or two on the A4 was built on not long after we arrived, and a drier area went shortly afterwards, as Slough builds on every last square inch. Also, there is a tendency for groups of the larger houses to jointly sell off parts of their gardens to allow still more houses to be crammed in. The newer the houses the more minute the gardens. Also since we came here the convent school has erected a junior school on a once-green site in its grounds. When the houses in this estate were built in 1974, the builders planted numerous decorative trees in sapling form close to buildings. Because of rapid growth to an unsuitable size, many large silver birch and weeping willow trees in the open-plan front gardens have been felled within the last ten years. The two species which have suffered most noticeably as a consequence of this loss are *S. ocellata* (Eyed hawk-moth) and *P. bucephala* (Buff tip). Many *M. tiliae* (Lime hawk-moth) larvae were also to be found on birch.

When we first moved here all the street lights were moth-friendly mercury vapour, but some ten years ago they were all converted to sodium (orange), which has been claimed as a flight suppressant. One light escaped the change, an accidental oversight no doubt, but neither this nor any of the remainder in the early days has ever in twenty-one years produced a single moth at rest on a concrete lamp standard or in flight.



Readers will notice the relative abundance of new records from the 1990s. This is, I suggest, at least partly explained by gradual changes in family routine. When we first moved to Slough our children were just turned four and two. Also, both sets of grandparents were alive, and so many days, weekends and holiday times in the warmer months were spent away from home. This left few opportunities for running the moth trap in the garden. Commitments gradually changed and by mid-teens the children's interest in outings with Mum and Dad was, to say the least, waning! Opportunities for trapping at home gradually grew in inverse proportions. Who knows what effect global warming may be having.

I cultivate a wide variety of standard garden shrubs and flowers, including heathers and petunias, but the only blossoms which I have known to attract moths are those of the common form of buddleia. This often swarms with *A. gamma* (Silver Y) – far more than ever come to light.

Retirement from my post in Whitehall in May 1997 has allowed trapping to take place on a much more regular basis. More importantly, an end to the daily grind of London commuting has allowed trapping to take place on suitable nights, rather than simply on those which did not precede the need to catch an early morning train. Accumulated leave allowed fairly regular trapping to be undertaken from mid-May onwards. However, there was windy and unseasonable cold weather in April and early May, as well as more limited opportunity, which restricted the number of occasions on which population sampling could take place. Frustratingly, this area suffered a power cut on 2nd May; one of the few good nights. Several weekends were spent in Plymouth on family business, including a long one in mid-June, and we took an overdue and much-needed holiday from 20th July to 1st August.

It must be confessed that, now that most of the likely winter species have been recorded, I find it increasingly easy to make excuses for not running the trap between mid-December and mid-February. *T. primaria* (Early moth) is the only surprising absentee, probably due to the general absence of hawthorn in the immediate vicinity. This winter inertia caused me to miss the very earliest species in the garden in 1997, as it had in 1991, and it was the appearance of *C. vaccinii* (the Chestnut) on a window on 17th February which prompted me into action. I was rewarded on the first night of trapping by the reappearance of *A. bispidaria* (Small brindled beauty). March was mild, with the Green-veined white, Brimstone and Holly blue seen in the garden by day on the 30th, to which were added the Small tortoiseshell and Peacock on the 31st.



The Orange tip appeared on 6th April, but then a long spell of cold and often frosty weather began. The 26th ushered in a short mild spell, which lasted over the first weekend in May. A short cold spell ended on 16th May with the appearance of the first *A. gamma*. A good haul of 33 species of macros arrived on the night of the 26th, including the first local record of *E. venosata* (Netted pug) and first garden records of *E. extersaria* (Brindled white-spot) and *A. alni* (Alder moth).

Things continued to improve into June, with 46 species recorded on the night of the 10th, including *T. ocularis* (Figure of eighty), which has become almost entirely melanic over the years, and a large female *C. margaritata* (Light emerald) with the pale bands wider than normal. Although there were fewer species on the next night, they included *B. piniaria* (Bordered white) and *O. versicolor* (Rufous minor), neither of which are common here, together with a fresh *N. revayana* (Oak nycteoline), which appears to have become double-brooded here over the past two or three years. All specimens of the last-named species are dark and drab, both here and in the local woods. Another new species to the garden, in the form of *D. porcellus* (Small elephant hawk-moth), arrived on the following night. Four nights in mid-June were spent in Plymouth, where many moths are much brighter than here, although actual catches were small because only the Heath trap could be used in the hilly town.

Relatively high catches were again a feature in early July, with 46 species on the 6th, 54 on the 7th and 48 on the 8th. The migratory *A. iphion* (Dark sword-grass), which is never common here, arrived on the 9th July, together with the first garden specimen of *T. batis* (Peach blossom). Fresh *N. revayana* appeared again on the 12th and 18th, together with the first garden specimen of *P. fuliginaria* (Waved black) on the latter date. A melanic specimen (ab. *nigra*) of the locally-uncommon *E. lariciata* (Larch pug) graced the trap on the 15th. The week-ending 13th July produced no fewer than 94 species of macros, quite credible for a town garden.

On 3rd August, two days after our return from holiday, *E. linariata* (Toadflax pug) visited the garden for the first time. Two nights later a welcome capture was a halved gynandromorph of *A. puta* (Shuttle-shaped dart) (right-hand male, left-hand female). A melanic female of this species, totally devoid of pale markings, appeared on the 8th. Two more new species to the garden appeared on the 7th: *D. falcata* (Pebble hooktip) and a rather worn *C. linearia* (Clay triple-lines), together with another *P. fuliginaria*. The first *P. saucia* (Pearly underwing) arrived on the 8th, and next night I was thrilled to find a



P. cucullina (Maple prominent), a second example of which appeared in 1998. The 10th and 12th produced 48 and 45 species respectively, but with little of note, although I did record that an *N. revayana* seen on the 10th was worn, and that the uncommon *S. notata* (Peacock moth) appeared on the 12th. A specimen of *A. segetum* with the subterminal area of the forewings black was taken on the 22nd. One can usually feel the sudden onset of autumn, and in 1997 the change was apparent on the 13th, with cooler nights from then on, although moth numbers recovered to 36 species on the 22nd. During the day of the 16th I had the pleasure of seeing a *C. pamphilus* (Small heath) in my garden, the long-awaited first record for this area. At around that time *P. rhomboidaria* (Willow beauty), *A. pyramidea* (Copper underwing) and *A. berbera* (Svensson's copper underwing) were particularly numerous. The weather turned wet and cooled again on the 24th.

Except for the capture of *E. repandaria* (Bordered beauty) on the 19th, September and the rest of the year proved largely unremarkable. A brief cold snap began on the 12th to the 17th, but numbers rose to 23 species on the 22nd, during which day a Comma was seen in the garden, and rising to 27 on the 24th. A welcome visitor on that date was *C. siterata* (Red-green carpet). Several *D. aprilina* (Merveille de jour) appeared in the garden for the first time in October, but catches were low from then on, with the number of specimens matching the number of species on some nights. On the 17th, a night of ten species and ten specimens, *L. clavaria* (The mallow) put in one of its rare appearances. The first severe frost struck on the 24th, with ever-dwindling numbers from then on.

A milder night on 14th November encouraged six species, including *A. gamma*, to visit the trap, but the great surprise of the month was the appearance of a very late *A. monoglypha* (Dark arches) on the 26th. This was presumably a second-brood specimen. Enthusiasm can flag at the end of the season, and the trap was run only once in December. As the 19th was a mild night, I was surprised that only *O. brumata* (Winter moth), which appeared at a window the previous night, turned up.

The year 1997 was poor for migrants, with none of the rarer moths and not a single Painted lady.

The highest weekly count in 1998 was 83 species of macros in week-ending 22nd July, with 50 species on the night of the 20th. Most of 1998 was average – below average for butterflies – but a poor late spring and early autumn led to the absence of many expected species. Indeed, there were only three suitable trapping nights between 26th September and 6th November.



One of the great and universal mysteries of every local list is the number of either singletons or non-migratory species which turn up in only one year. My list is no exception. There are even three such records from the poor season of 1991. While it is possible that many of these were blown in from who knows where on freak air currents, the widely-spaced records of *C. ocellata* (Purple bar), *E. prunata* (the Phoenix), *C. fulvata* (Barred yellow), *G. augur* (Double dart), *I. subtusa* (the Olive) and *A. sparganii* (Webb's wainscot), together with the recent records of *E. linariata* and *P. cucullina*, could indicate weak local colonies or recent colonisation.

Several species, such as *C. pudibunda* (Pale tussock), *C. pisi* (Broom moth), *A. sordens* (Rustic shoulder-knot), *P. umbra* (Bordered sallow) and *P. moneta* (Golden plusia), all of which were regular in the early days here, have long since disappeared. A gradual decline in the number of thorns and prominents has been noticeable. Of individual species *H. humuli* (Ghost moth) has declined noticeably (and has not been seen at the largest local site). Among the geometers *X. ferrugata* (Dark-barred twin-spot carpet) has declined, its place being taken by *C. pectinataria* (Green carpet), while *P. rubiginata* (Blue-bordered carpet) has always been very erratic in its appearance. Another species which is now less common is *E. icterata* (Tawny-speckled pug). *E. millefoliata* (Yarrow pug) was on at least one local site when we arrived in Slough in the summer of 1977, but it took 14 years to reach my garden. Almost all specimens of *B. betularia* (Peppered moth) in both the garden and the local area are typical, which I find surprising.

Up to now *L. populi* (Poplar hawk-moth) has just about outnumbered all other sphingids combined, but if *H. pinastri* (Pine hawk-moth) continues to increase this may cease to be the case – *H. pinastri* already outnumbers all other hawks combined at one local site. I have observed that the local decline of *A. caja* (Garden tiger) has been repeated as far afield as Plymouth. In some years when I grow sweet williams the larvae of *H. compta* (Varied coronet) are commoner on them than those of *H. bicruris* (the Champion), whereas in others only the latter are present. As a group the sharks have always been uncommon. Somewhat surprisingly, *A. lutulenta* (Deep-brown dart) has been as persistently common (indeed, commoner than I have known it elsewhere) as *A. oxyacanthae* (Green-brindled crescent) has been persistently uncommon, of which the latter the unadorned f. *capucina* is almost absent. The local *P. flavicincta* (Large ranunculus), another species commoner here than I have known anywhere else, are fairly large and heavily marked with saffron. All garden specimens of



C. coryli (Nut-tree tussock) are more or less of the typical form, whereas the dark ab. *melanotica* is quite common locally.

Of the new records in 1998, three species have not been recorded elsewhere in the local area.

Over the twenty or so years countless numbers of the November moth group and the daggers have come to the garden trap, but, despite checking the genitalia of all males with a 20x hand lens, only *E. dilutata* (November moth) and *A. psi* (Grey dagger) have been found to occur. Related species are known to occur at other local sites. As *M. didyma* (Remm's rustic) is known to occur regularly in the garden, I no longer check the genitalia of all male "*secalis*".

Being so far from any coast it is not surprising that migrants have been so scarce here over the whole period under review. Perhaps the most remarkable, and certainly the most entertaining record is that of *H. armigera* (Scarce bordered straw). It was 1992 and our daughter's first Christmas home from university. I was enjoying a quiet soak in the bath, when she rushed in clutching a caterpillar which she had spotted strolling across the sitting room carpet. She was surprised to have found a caterpillar indoors, and especially at that late date. I was thrilled, as I instantly recognised it as something my memory told me was "good". Having previously bred the species in 1966 (ex-imported tomato) and remembering photos I had seen, I suspected *H. armigera*, and a hurried end to my ablution brought rapid confirmation. The question was, where had it come from, and a vase of shop-bought chrysanthemums on the dining room table was the only possible answer. However, these had clearly been irradiated – they lasted about four weeks in the centrally-heated house – and so how had this caterpillar survived? The larva fed most happily on lettuce, which was of course washed before serving, and a typical pale specimen emerged on 21st January 1993. But what luck! The poor creature could have drowned, or have been stepped on, or it could have escaped notice and starved to death miserably in some hidden corner.

Who knows what the future will bring: not better migrants this far inland, I suspect. The gradual warming of the seasons will help, but the insidious reduction of urban habitat is sure to counterbalance this to at least some extent. First and last dates are creeping ever outwards. My special hope is that *S. w-album* reappears.

[illegible]

See page 164 for key.

1991) of these means could affect the

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	23.2	23.7	24.2	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>A. aestivaria</i>	FC	-	Y	Y	7.2-19.3	(A)	2	2	2	4	2	1	3	2	5	4	1	4	5	6	3	2	5	6	7	5	3	5	0	3	3	3	2	
March moth	(B)	1	1	2																														
<i>C. bajularia</i>	S	-	-	-	1 on 19.vi.1992																													
Blotched emerald																																		
<i>H. aestivaria</i>	FC	-	Y	Y	21.6-19.7	(B)									1		2																	
Common emerald																																		
<i>H. chrysoprasaria</i>	O	-	-	Y	6.7-17.7	(B)																												
Small emerald					First in 1990																													
<i>C. porata</i>	S	-	-	-	Not seen since May 1978																													
False mocha																																		
<i>C. punctaria</i>	FC	-	Y	Y	15.5-27.9	(B)							1																					
Maiden's bush					First in 1989																													
<i>O. linearis</i>	S	-	Y	-	1 on 7.viii.1997	(B)																												
Clay triple-lines																																		
<i>T. griseata</i>	FC	-	Y	Y	21.5-29.9	(B)							1	1																				
Blood-vein																																		
<i>S. marginipunctata</i>	S	-	-	-	1 on 30.ix.1985																													
Mullein wave																																		
<i>S. imilaria</i>	R	-	Y	Y	15.6-22.9	(B)																												
Small blood-vein																																		
<i>I. nulpinaria</i>	R	-	Y	Y	6.7-5.8	(B)																												
Least carpet					First in 1996																													
<i>I. hesitata</i>	U	-	Y	Y	13.7-19.7	(B)																												
Small fan-footed wave																																		
<i>I. fuscicornis</i>	FC	Y	Y	Y	16.6-9.8	(B)																												
Dwarf cream wave																																		
<i>I. soritia</i>	R	Y	Y	Y	26.5-3.10	(B)							1	1	1																			
Small dusty wave					Most at rest by day; few at m.v. light. First in 1985																													
<i>I. dimidiata</i>	FC	Y	Y	Y	6.6-26.8	(B)							1																					
Single dotted-wave																																		
<i>I. ingeminata</i>	FC	Y	Y	Y	3.6-2.8	(B)								2	3																			
Treble brown-spot																																		

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	23.2	23.3	9.3	16.3	30.3	6.4	27.4	4.5	18.5	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>I. emarginata</i> Small scallop	R	Y	Y	Y	1.7-5.8	(B)																																
	A	Y	Y	Y	3.6-14.9	(B)																																
<i>I. aversata</i> Ribband wave	S	-	-	Y	6.viii.1994 and 4.ix.1998																																	
<i>R. sacra</i> The Vestal	S	-	-	Y	9.viii.1996, 14.viii. & 20.viii.1998																																	
<i>O. obliquata</i> The Gem	U	-	Y	-	24.5-31.8	(B)																																
<i>X. designata</i> Flame carpet	U	Y	-	Y	2.5-4.8																																	
<i>X. spadicaria</i> Red twin-spot carpet	O	Y	-	-	8.7-10.8																																	
<i>X. ferrugata</i> Dark-banded twin-spot carpet	U	-	Y	-	30.5-10.6	(B)																																
<i>X. montanota</i> Silver-ground carpet	A	Y	Y	Y	3.5-18.10	(B)																																
<i>X. fluctuata</i> Garden carpet	U	Y	Y	-	8.7-3.8	(B)																																
<i>S. chenopodiata</i> Shaded broad-bar	A	Y	Y	Y	3.5-11.9	(B)																																
<i>E. alternata</i> Common carpet	C	Y	Y	Y	21.6-19.9	(B)																																
<i>C. bilineata</i> Yellow shell	O	-	Y	-	3.10-17.10	(B)																																
<i>L. clavaria</i> The Mallow	S	Y	-	-	30.iii & 5.iv.1991																																	
<i>A. badia</i> Shoulder stripe	S	Y	-	-	1 on 12.iv.1991																																	
<i>A. derisuta</i> The Streamer	U	-	-	-	28.7-20.8																																	
<i>P. conilata</i> Dark spinach																																						

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.

[illegible]

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run.

of nights in week ending that this species was recorded.

[illegible]

See page 164 for key.

Species	Status	Seen in	Inclusive	Notes	W/E
		91	97	98	(A)
<i>E. subfasciata</i> Grey pug	FC	-	Y	5-6-2.8	(B)
<i>E. icterata</i> Tawny-speckled pug	U	Y	Y	10.8-31.8	(B)
<i>E. succenturiata</i> Bordered pug	R	Y	Y	6.7-15.8	(B)
<i>E. millefolia</i> Yarrow pug	C	Y	Y	30.6-29.8	(B) First in 1991
<i>E. simplicata</i> Plain pug	U	Y	Y	18.7-25.8	(B)
<i>E. nanata</i> Narrow-winged pug	O	-	-	26.5	(B)
<i>E. abbreviata</i> Brindled pug	R	Y	Y	19.3-4.5	(B)
<i>E. dodonetta</i> Oak-tree pug	FC-C	Y	Y	4.4-7.6	(B)
<i>E. laricuta</i> Larch pug	U	-	Y	16.7-2.8	(B) First in 1995
<i>C. v-dita</i> The V-pug	S	-	-	-	(B) 1 on 22.vii.1994
<i>c. rectangularis</i> Green pug	C	Y	Y	26.5-17.7	(B) First in 1990
<i>G. rufifasciata</i> Double-striped pug	C	Y	Y	1.2-25.9	(B)
<i>C. legatella</i> The Streak	S	-	-	-	(B) 1 on 22.x.1994
<i>A. effornata</i> <i>A. plagiata</i> Treble-bar	U	Y	Y	27.5-9.8	(B) Commoner in 2nd brood
<i>A. effornata</i> Lesser treble-bar	C	Y	Y	16.5-6.10	(B) Much commoner than <i>plagiata</i> commoner in 2nd brood
<i>L. holletaria</i> The Scraphin	O	-	-	2.5-6.6	(B) First in 1992

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run.

(B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
<i>P. sexualata</i> Small seraphim	U	-	Y	5.6-11.6	First in 1995	(A)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run.

B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	22.2	22.3	9.3	16.3	30.3	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>O. bidentata</i> Scalloped hazel	O	-	Y	7.5-6.6	(A)	2	2	2	2	4	2	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12
<i>C. elingaria</i> Scalloped oak	C	Y	Y	Y	9.6-17.8	(B)																																	
<i>O. sambucaria</i> Swallow-tailed moth	R	Y	Y	Y	27.6-19.8	(B)																																	
<i>C. pennaria</i> Feathered thorn	FC	-	Y	Y	10.10-16.11	(B)																																	
<i>A. bipidaria</i> Small brindled beauty	U	-	Y	-	4.2-22.2	(B)	1																																
<i>A. pilosaria</i> Pale brindled beauty	U	-	-	Y	5.2-8.3	(B)																																	
<i>L. hirtaria</i> Brindled beauty	FC-C	Y	Y	-	27.3-22.4	(B)				4																													
<i>B. strataria</i> Oak beauty	R	-	Y	Y	5.6-18.3	(B)			1																														
<i>B. betularia</i> Peppered moth	R	-	Y	Y	4.6-26.7	(B)																																	
<i>A. leucophaea</i> Spring usher	U	-	-	Y	28.1-25.2	(B)																																	
<i>A. marginaria</i> Dotted border	R	-	Y	-	22.2-9.3	(B)	1	2																															
<i>E. defoliaria</i> Mottled umber	U-FC	-	Y	Y	10.10-5.1	(B)																																	
<i>M. abruparia</i> Waved umber	U	-	Y	-	26.5-10.6	(B)																																	
<i>P. rhomboidaria</i> Willow beauty	A	Y	Y	Y	28.6-1.10	(B)																																	
<i>A. repandata</i> Mottled beauty	R	-	Y	Y	20.6-15.7	(B)																																	
<i>S. paucinalis</i> Pale oak beauty	O	-	-	Y	22.5-3.6	(B)																																	

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run.

(B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	23.2	2.2	9.3	16.3	30.3	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>E. histariata</i> The Engrailed	U	-	Y	29.6-25.8	(B)																																		
<i>E. extensaria</i> Banded white-spot	S	-	Y	-	(B)																																		
<i>B. piniaria</i> Bordered white	R	-	Y	11.6-18.7	(B)																																		
<i>C. pisaria</i> Common white wave	R	-	Y	1.6-4.8	(B)																																		
<i>C. exanthematella</i> Common wave	FC	-	Y	6.7-25.8	(B)																																		
<i>L. binaculata</i> White pinion-spotted	S	-	-	18.5	(B)																																		
<i>L. tenerata</i> Clouded silver	FC	-	Y	22.5-19.7	(B)																																		
<i>C. margaritata</i> Light emerald	FC	-	Y	23.5-5.7	(B)																																		
<i>H. fasciaria</i> Barred red	FC	-	Y	3.7-20.7	(B)																																		
<i>H. pinastri</i> Pine hawk-moth	R	-	Y	11.6-8.8	(B)																																		
<i>M. illiae</i> Line hawk-moth	R	-	Y	30.4-26.6	(B)																																		
<i>S. ocellata</i> Eyed hawk-moth	U	Y	-	7.6-13.7	(B)																																		
<i>L. populi</i> Poplar hawk-moth	FC	Y	Y	1.5-17.8	(B)																																		
<i>D. elephant</i> Elephant hawk-moth	FC	Y	Y	25.5-27.7	(B)																																		
<i>D. parcellus</i> Small elephant hawk-moth	S	-	Y	-	(B)																																		
<i>P. bocephala</i> Buff tip	R	-	Y	24.5-4.8	(B)																																		

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	23.2	23	9.3	16.3	30.3	6.4	27.4	4.5	18.5	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>C. titula</i> Puss moth	S	-	-	-	1 on 1.v.1994	(A)	2	2	2	2	4	2	1	3	2	3	5	4	1	4	5	6	3	2	5	6	7	5	3	5	6	3	3	4	3	3	3	2
<i>F. furcula</i> Sallow kitten	S	-	-	-	1 on 12.vii.1996																																	
<i>N. dromedarius</i> Iron prominent	U	-	Y	-	29.7-12.8 First in 1995	(B)																			1													
<i>E. ziczac</i> Pebble prominent	O	-	-	Y	8.5-10.8																																	
<i>P. tremula</i> Swallow prominent	R	Y	Y	-	31.5-25.8 First in 1985	(B)																		1	1													
<i>P. cicadina</i> Maple prominent	U	-	Y	Y	9.viii.1997 and 22.v.1998	(B)																		1														
<i>P. palpinia</i> Pale prominent	FC	Y	Y	Y	30.4-16.8	(B)										1								3														
<i>D. ruficornis</i> lunar marbled brown	U	-	-	-	17.4-26.8 First in 1992																																	
<i>C. curtula</i> Chocolate-tip	R	-	Y	Y	1.5-26.8 First in 1990	(B)															1																	
<i>O. antiqua</i> The Vapourer	U	-	Y	Y	9.8-7.9	(B)																																
<i>C. pudibunda</i> Pale tussock	O	-	-	-	Not since 1980s																																	
<i>E. chrysorrhoea</i> Brown-tail	R	-	Y	Y	6.7-7.8 First in 1995	(B)												1	5	2																		
<i>E. similis</i> Yellow-tail	R	Y	Y	Y	6.7-27.7	(B)													1	1																		
<i>E. complana</i> Scarce footman	A	Y	Y	Y	23.6-18.8 Increasing since 1997. First in 1991	(B)												3	3	6	3	2	5	1														
<i>E. luridivola</i> Common footman	A	Y	Y	Y	19.6-25.8	(B)																																
<i>A. calpa</i> Garden igger	O	Y	-	-	27.7-17.8 Declining. Not since 1996																																	

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	22.2	22.3	9.3	16.3	30.3	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>S. tataricoides</i> White ermine	R	Y	Y	Y	17.5-18.6	(A)	2	2	2	4		2	1	3	2	5	4	1	4	5	6	3	1	3	2	5	6	7	5	3	5	6	3	3	4	3	3	2
<i>S. lutea</i> Buff ermine	U	-	-	Y	7.6-26.7	(B)								1	1	2	4																					
<i>D. mendica</i> Muslin moth	FC-U	Y	Y	-	5.4-24.5	(B)					1																											
<i>P. fuliginosa</i> Ruby tiger	R-FC	Y	Y	Y	12.7-8.9	(B)																																
<i>C. jacobaeae</i> The Cinnabar	U	-	Y	Y	1.6-20.7	(B)																																
<i>N. cucullatella</i> Short-cloaked moth	FC	-	Y	Y	5.6-13.7	(B)											2																					
<i>N. confusalis</i> Least black arches	R-FC	Y	Y	Y	24.4-26.5	(B)						1	1	1																								
<i>E. tritici</i> White-line dart	S	-	-	-	1 on 17.viii.1996																																	
<i>E. nigricans</i> Garden dart	O	-	Y	-	12.8	(B)																																
<i>A. agestum</i> Turnip moth	C	Y	Y	Y	17.5-11.10	(B)																																
<i>A. clavis</i> Heart & club	A	Y	Y	Y	7.6-26.7	(B)																																
<i>A. exclamantis</i> Heart & dart	A	Y	Y	Y	3.5-25.8	(B)																																
<i>A. trux</i> Crescent dart	S	-	-	-	1 on 18.viii.1992																																	
<i>A. apollon</i> Dark sword grass	U	-	Y	-	9.7-3.11	(B)																																
<i>A. ruta</i> Shuttle-shaped dart	C	Y	Y	Y	23.4-18.10	(B)																																
<i>A. maris</i> The Flame	FC	Y	Y	Y	23.6-2.8	(B)																																

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.

[illegible]

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run.

of nights in week ending that this species was recorded.



Species	Status	Seen in	Inclusive	Notes	W/E	23.2	23.5	23.9	16.3	30.3	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12
<i>N. typica</i>	S	-	-	-	1 on 8.xiii.1995	(A)	2	2	2	2	4	2	1	3	2	3	5	4	1	4	5	6	3	2	5	6	7	5	3	5	6	3	3	4	3	3	3	2
<i>E. occulta</i>	S	-	-	-	1 on 30.viii.1996	(B)																																
<i>D. trifida</i>	R	Y	Y	Y	3.6-31.8	(B)																																
<i>H. nana</i>	U	-	Y	-	31.5-29.6	(B)																																
<i>P. nebulosa</i>	U	-	Y	-	23.6-7.7	(B)																																
<i>M. brassicae</i>	R	Y	Y	Y	16.7-31.8	(B)																																
<i>M. persicariae</i>	O	-	-	Y	11.7-21.7	(B)																																
<i>L. undulatum</i>	R	-	Y	Y	17.5-2.6	(B)																																
<i>L. thalassina</i>	O				2.6																																	
<i>L. thalassina</i>	Pale-shinkered broad-leaved																																					
<i>L. stassa</i>	R	Y	-	Y	24.5-7.9																																	
<i>L. stassa</i>	Dog's tooth																																					
<i>L. olivacea</i>	C	Y	Y	Y	3.5-31.8	(B)																																
<i>L. olivacea</i>	Bright line brown-eye																																					
<i>C. fida</i>	O	-	-	-	Not since early 1980s. Was R																																	
<i>H. bicolorata</i>	PC	Y	Y	Y	12.6-21.7	(B)																																
<i>H. bicolorata</i>	Broad barred white																																					
<i>H. didactyla</i>	O	-	-	-	21.6																																	
<i>H. didactyla</i>	The champion																																					
<i>H. campyla</i>	O	-	-	-	27.6																																	
<i>H. campyla</i>	Varied coronet																																					
<i>H. bicolorata</i>	R	-	Y	Y	23.5-30.7	(B)																																
<i>H. bicolorata</i>	The flycatcher																																					



Species	Status	Seen in	Inclusive	Notes	W/E	23.2	2.3	9.3	16.3	30.3	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12	
<i>C. graminis</i> Anlier moth	S	-	-	-	91	97	98																																
<i>P. flammeca</i> Pine beauty	S	-	-	Y	28.4	16.5																																	
<i>O. cruda</i> Small quaker	C	Y	Y	Y	5.3	13.4		2	2	2																													
<i>O. gracilis</i> Powdered quaker	FC	-	Y	Y	29.3	8.5					2																												
<i>O. cerasi</i> Common quaker	C	Y	Y	Y	19.2	30.4		1	2	2	3	1																											
<i>O. incerta</i> Clouded drab	FC	Y	Y	Y	7.3	10.5		2	2	2	1	1	1																										
<i>O. munda</i> Twin-spotted quaker	U	-	Y	Y	6.3	14.3		1	1																														
<i>O. gobica</i> Hebrew character	A	Y	Y	Y	18.2	10.6		2	2	4	2	1	2																										
<i>M. conigera</i> Brown-line bright-eye	U	Y	Y	-	13.7	9.8																1																	
<i>M. ferrago</i> The Clay	C	Y	Y	Y	21.6	17.8												1	4	5	6	3	1																
<i>M. vitellina</i> The Delicate	S	-	-	-																																			
<i>M. impura</i> Smoky wainscot	FC	Y	Y	Y	21.6	10.8											1	1	4	4	6	3		1															
<i>M. pallens</i> Common wainscot	C	Y	Y	Y	26.5	12.10											3	3	1	3	1			2	5	6	5	4											
<i>M. comma</i> Shoulder-striped wainscot	U	Y	Y	-	4.6	11.7																																	
<i>C. chamonillae</i> Chamonille shark	O	-	-	-	23.4	7.5																																	
<i>C. umbratica</i> The Shark	O	-	Y	-	12.6	8.7												1				1																	
	W/E	23.2	2.3	9.3	16.3	30.3	6.4	27.4	4.5	18.5	1.6	8.6	15.6	22.6	29.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12					

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.



See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.

[illegible]

See page 164 for key.

Species	Status	Seen in	Inclusive	Notes	W/E	23.2	23.3	9.3	16.3	30.3	27.4	4.5	18.5	1.6	8.6	15.6	22.6	6.7	13.7	20.7	3.8	10.8	17.8	24.8	31.8	7.9	14.9	21.9	28.9	5.10	12.10	19.10	9.11	16.11	30.11	21.12
<i>A. lithoxyla</i>	C	Y	Y	98	(A)	2	2	2	2	4	2	1	3	2	3	5	4	1	4	5	6	3	2	5	6	7	5	3	5	6	3	3	3	3	2	
Light arches					(B)											2			4	5	6	2														
<i>A. epomidon</i>	O	-	-	-	17-16.7																															
Clouded brindle																																				
<i>A. remissa</i>	S	-	-	-	17-2.7																															
Dusky brocade																																				
<i>A. unanimitis</i>	R	-	Y	Y	26.5-21.6									1																						
Small clouded brindle																																				
<i>A. anceps</i>	O	Y	-	-	9.6-27.6																															
Large nutmeg																																				
<i>A. sordens</i>	S	-	-	-																																
Rusty shoulder-knot																																				
<i>O. strigilis</i>	C	Y	Y	Y	16.5-20.7									1	2	4	2	1																		
Marbled minor																																				
<i>O. versicolor</i>	R	-	Y	Y	11.6-11.7											1																				
Rufous minor																																				
<i>O. latruncula</i>	C	Y	Y	Y	17.5-20.7									1	3	5	4		4	4	1															
Tawny marbled minor																																				
<i>O. fasciuncula</i>	C	Y	Y	Y	24.5-9.8									1	2	1																				
Middle-barred minor																																				
<i>M. furuncula</i>	C-A	Y	Y	Y	6.7-31.8																															
Cloaked minor																																				
<i>M. secalis</i>	C-A	Y	Y	Y	27.6-3.9																															
Common rustic																																				
<i>M. didyma</i>	?	Y	Y	Y	9.8-4.9																															
Remm's rustic																																				
<i>L. testacea</i>	C-A	Y	Y	Y	8.8-28.9																															
Flouenced rustic																																				
<i>A. oculea</i>	R	Y	Y	Y	11.7-30.8																															
Ear moth																																				
<i>H. micacea</i>	FC	Y	Y	Y	6.8-28.9																															
Rosy rustic																																				

See page 164 for key.

(A) Number of nights in week ending that m.v. trap was run. (B) Number of nights in week ending that this species was recorded.



See page 164 for key.

See page 164 for key.



The following new species of macro-moth were added in 1998.

<i>P. pruinata</i>	1 on 21.vii.1998
Grass emerald	
<i>L. adistata</i>	1 on 13.viii.1998
Scorched carpet	
<i>A. aurantiaria</i>	1 on 9.xii.1998
Scarce umber	
<i>M. athula</i>	1 on 20.vii.1998
Kent black arches	
<i>B. tinnialis</i>	1 on 1.vii.1998
Minor shoulder-knot	
<i>P. nitima</i>	1 on 20.vii.1998
Small dotted buff	
<i>H. rostralis</i>	1 on 6.vii.1998
Buttoned snout	
<i>H. grisealis</i>	1 on vii.1998
Small fan-foot	

Butterflies

<i>T. sylvestris</i>	R	
Small skipper		
<i>O. venata</i>	O	
Large skipper		
<i>G. rhamni</i>	U	
Brinestone		
<i>P. brassicae</i>	FC	
Large white		
<i>P. rapae</i>	C-A	Earliest date is 30.iii.
Small white	C	Earliest date is 30.iii.
<i>P. napi</i>	FC	Earliest date is 6.iv.
Green-veined white	R	1993-1995 inc.
Orange tip	U	First in 1990
<i>S. alba</i>	O	
White-letter hairstreak	U-C	Fluctuates, but three broods in 1997
<i>L. phlaeas</i>		Date span is 30.iii-8.ix.
Small copper	R-C	Few in 1997
<i>P. icarus</i>	U-A	First in 1991
Common blue	C	Not seen in 1997
<i>C. argus</i>		Very common in 1997
Holly blue	C	1997 a good year
<i>V. atalanta</i>	U-FC	Fewer in 1997
Red admiral	C-A	Fewer in 1997
<i>C. cardui</i>	S	Date span is 30.iii-6.x.
Painted lady		Not seen here for very many years.
<i>A. urticae</i>	S	1 in 1993
Small tortoiseshell	C	
<i>N. io</i>		
Peacock		
<i>P. celtica</i>		
Gemma		
<i>P. agestis</i>		
Speckled wood		
<i>L. megera</i>		
Wall brown		
<i>M. galathea</i>		
Marbled white		
<i>P. tithonus</i>		
Gatkeeper		
<i>M. jurtina</i>		
Meadow brown		
<i>C. pamphilus</i>		
Small heath		

Legend

- A = Relatively abundant; about 100+ each year.
 C = Common; about 50+ each year.
 FC = Fairly common; more than a dozen or so each year.
 R = Regular; a few each year.
 U = Uncommon; a few most years.
 O = Occasional; an average of less than one per year.
 S = Scarce; no more than two or three in twenty years.

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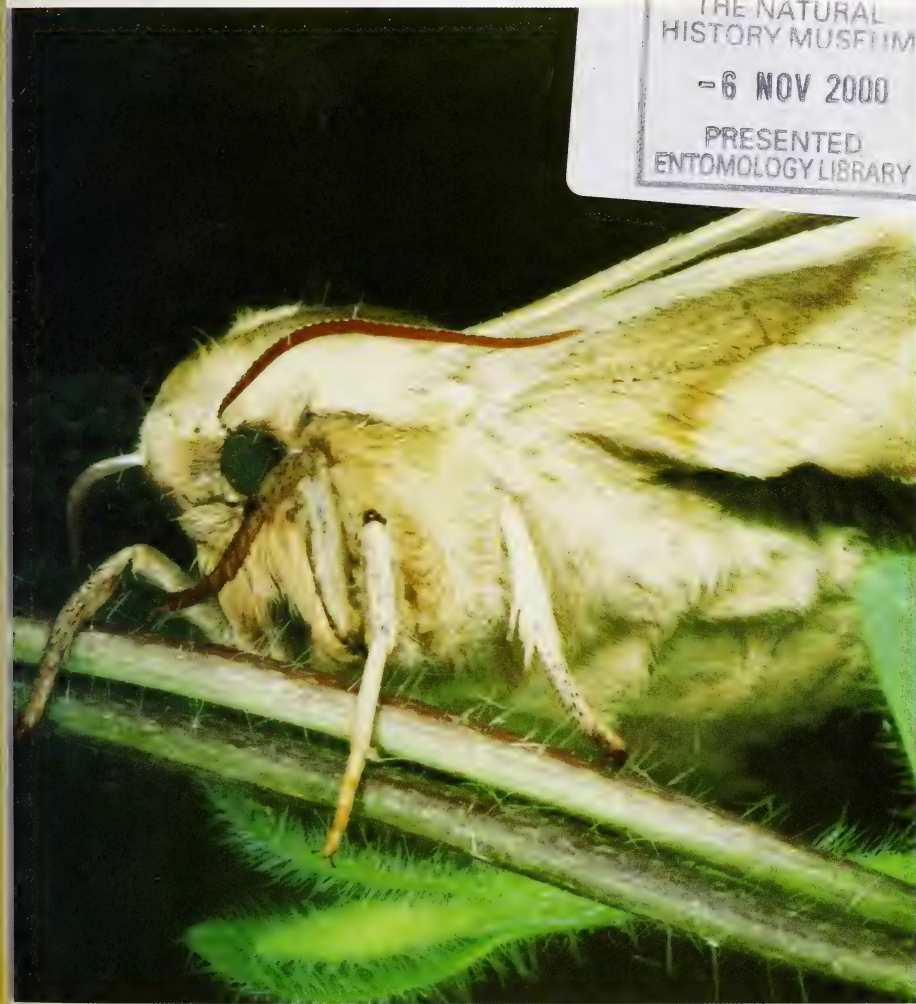
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The Aurelian Legacy – British Butterflies and their Collectors

by Michael A. Salmon

with additional material by Peter Marren and Basil Harley



Foreword by The Hon. Miriam Rothschild, DBE, FRS

A history of British butterflies cannot be separated from that of their collectors, since our knowledge of them is the result of four hundred years of collection and study. A mere fifty years ago many now uncommon species were widespread and abundant – their subsequent seemingly irreversible decline owing more to changes in land management and the environment than past collecting. Given the present state of butterfly populations, indiscriminate collecting can no longer be justified.

This thoroughly researched, highly informative and enjoyable book includes a short history of butterfly collecting in Britain and of equipment used; brief biographies of 101 deceased lepidopterists generously laced with anecdotes and quotations, and many contemporary monochrome portraits; accounts of selected species of historical interest; and an appraisal of the effect of collecting and current conservation policies. Appendixes list all the British and Irish butterflies with their earlier vernacular names; and provide a chronological account of entomological societies, publications and significant events. The work concludes with a comprehensive Bibliography and Index. As well as colour photographs of historic specimens, the superlative colour plates and text figures of butterflies by eighteen artists from Petiver to Frohawk – some never previously reproduced – are an outstanding feature of the book.

Michael Salmon has made a lifelong study of British butterflies and, with his collaborators, provides a fascinating account of the men and women who have made such valuable contributions to our knowledge of British butterflies and of their past and often complex history. *The Aurelian Legacy* is not only a very 'good read' for naturalists but an excellent scholarly resource for lepidopterists and social historians.

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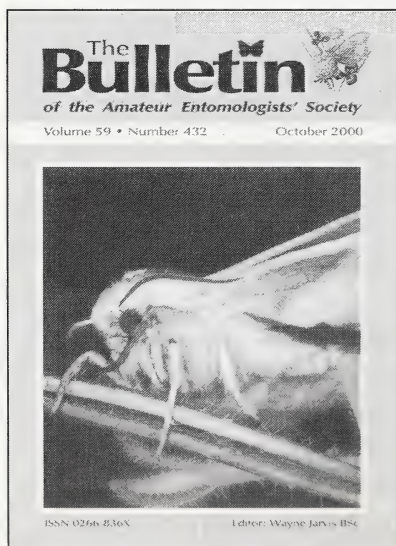


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The cover of the *Bulletin* features the head of an adult female Lime Hawk moth (*Mimas tiliae*)

The Lime Hawk is a very characteristic moth that is easily recognised. It is found in deciduous woodlands in England, except the extreme north, but is more common in the south. The adult flies from late May to early July. The wingspan is 60-80mm, so it is one of the smaller hawkmoths. The female produces a sex attractant chemical which males are able to detect from considerable distances. It will lay eggs on a variety of trees, including Oak and Birch, but the preferred food plants of the larvae are Lime, Elm, Alder and Cherry. On occasions the caterpillars may be so abundant that it is a pest.

Photo: Nick Holford.

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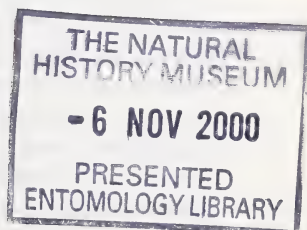
October 2000

Editorial

The Annual Exhibition held on 7th October at Kempton Park was one of the best attended in the event's history, despite some very inclement weather. The event passed by extremely well and thanks must go to all those who helped in the organisation of the day's event. We are trying to improve things still further in the future, and your feedback to help in this matter would be very gratefully received. If you have any suggestions please send them to me either via e-mail (wayne@theaes.org) or via the PO Box address. On a final note regarding the exhibition, next year's event will take place on Saturday 6th October at Kempton Park.

The response to a recent editorial regarding the Society has yielded a couple of responses from members who have said that they would be willing to help the Society in some way. We are still looking for new members of Council to help on the management side of the Society, and we are especially looking for someone with some experience in publicity to help us promote the Society more effectively. Once again I stress that without support from the membership and through volunteers to help run the Society we will be unable to continue with our work. This means that events such as the exhibition and information via our publications will be lost to the entomological community. As usual, anyone who is able to help, please get in touch.

Wayne





One Weekend in May

Dr Peter G. Sutton, AES Habitat Conservation Officer

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The weekend beginning Saturday 27th May proved, paradoxically, to be very successful in terms of the rare and unusual species that were encountered. Paradoxically, because the rapidly changing weather conditions displayed all the unpredictability that we have come to expect from our Oceanic climate, and the possibility of each day collapsing into a "wash-out" was ever present. The wind was strong and blustery, cloud cover was generally extensive bar a few scattered patches of blue which appeared and disappeared in the changing light, and the occasional showers that swept overhead were brief, but heavy. In spite of this, the intermittent sunny spells were strong and bright, and it was always possible that any warm sheltered spot encountered would provide a buzzing oasis of life to observe.

Stopham Bridge, west of Pulborough in West Sussex, was the first port of call on the Saturday morning. Stopham Bridge is an old stone bridge that crosses the River Arun, and provides a picturesque location for some of our rarer species of dragonfly. The river is fairly wide at the point where the bridge crosses, and the shallow glides which descend into deeper channels in the middle of the river, are flanked by reedbeds at their landward edge. The edge of the reedbeds in turn are met by shrub and tree cover. This site is apparently the best location in Sussex for the Club-tailed dragonfly *Gomphus vulgatissimus*, a species recorded from only seven river systems in the UK. However, upon arrival at the site, torrential rain from the previous day had swollen the river to a muddy torrent, submerging all but the most extensive reedbeds, and flooding most of the surrounding water meadows. At first site, the chances of locating any dragonflies in the blustery and overcast conditions appeared to be less than slim. Undeterred, and after a quick tour of the area, it was decided that the most productive area would be the sheltered stretch of shrubby grassland between Stopham Bridge and the adjacent A283 road bridge, leading down to a small remaining area of unsubmerged reedbed. A period of warm sunshine transformed the scene, and a Green woodpecker swooped down in front of us as the first butterflies appeared from the long grass, floating in the bright sunlight. One landed several yards away, and I watched it feeding on nectar as I peered through the grass stems. To my surprise, it was a Brown argus *Aricia agestis*, and the bright orange spots on immaculate chocolate-brown wings betrayed its recent metamorphosis. Nearby, I followed a female Broad-bodied chaser *Libellula depressa*



which had descended into the grass. Alert and fully aware of my presence, it swivelled its globe eyes on pivotal head towards my own single glass eye, and I froze the moment with a "click" (Plate 00Q). It remained unphased, preferring to sun itself with all the confidence of one who knows that disappearance is but an eye-blink away.

I left Sara to sketch flowers among the Ox-eye daisies and wandered towards the river to stalk the reeds with my camera. As I walked, more butterflies and damselflies lifted from the grass, a Large white *Pieris brassicae*, a Brimstone *Gonepteryx rhamni*, and several Common blues *Polyommatus icarus*. The damselflies were the Large red *Pyrrosoma nymphula*, the Blue-tailed *Ishnura elegans*, and several males of the unmistakable Banded demoiselle *Calopteryx splendens*, with their brilliant metallic blue bodies and midnight blue wing patches.

Another period of darkness followed, and within a minute, the aerial display had all but subsided. The occasional gust buffeted reeds and shrubs as I waited, but an overall calm remained, and as the sun drenched the flooded scene once more, the peerless scent of wild honeysuckle sweetened the air around me.

Among the reeds, I came across several more female Broad-bodied chasers hanging from the leathery green stems like Chinese paper lanterns. One by one, they lifted from their perches to survey the hunting ground. Each hovered momentarily, while a series of rudimentary calculations took place in that primordial chitin-encased nerve bundle, and the dragonfly locked onto and pursued its chosen prey with all the speed and pinpoint accuracy of a heat-seeking missile. Surprisingly, the powder-blue males of either this species, or my second quarry, the Scarce chaser *Libellula fulva*, were nowhere to be found. However, a thorough search of the reedbed did reveal a single bright orange female of the latter species, which promptly took off and landed on a bramble bush some distance away. I made my way past each Hemlock water dropwort crown through the lush tangle of growth towards the bramble until I could see the resting dragonfly. This rare species is confined to a handful of rivers and nearby still-water sites in England, and like the White-legged damselfly *Platycnemis pennipes* is vulnerable to pollution. The Scarce chaser clung to the bramble, and as another sunny interval highlighted the netted yellow margins of its wings, I tried to capture this skittish creature on film without disturbing it (Plate 00R). Inevitably, and one solar energy boost later, the Chaser had performed the trick all too familiar to dragonfly photographers, where the split second eye adjustment between camera settings and view finder is all the time required to leave the puzzled photographer contemplating a "habitat shot".



The journey towards Petworth was hastened by the appearance of the first penny-piece raindrops, serving notice that another localised downpour was on its way, and the darkening sky had become almost black above us. No sooner had we driven a mile or so, and the countryside was bathed in sunshine again. We drove south across country through green corridors of sparkling woodland, where each tree was adorned by a myriad of glistening rainbow droplets collected during the last deluge. The brow of a steep hill offered a panoramic view of the patchworked Sussex countryside, and on the horizon, a procession of fanning sunbeams cascaded from the heavens, casting bright footprints as they marched across the land.

Our intended destination was an area of land that was actively managed by English Nature in an attempt to reverse the declining fortunes of one of our rarest Orthoptera, the Field cricket *Gryllus campestris*. The site, formerly covered by trees and scrub, had been completely cleared in the light of new evidence which suggested that the Field cricket was a pioneer species which would colonise and thrive on areas of disturbed land. This theory had borne fruit, and we were welcomed by the sound of singing crickets as we drove along the road towards the conservation area. There is something particularly joyous about listening to the musical trilling of the Field cricket in May, doubly enhanced by the fact that this species had been rescued from the very brink of extinction. In the early 1990's, the Field cricket had declined to a single site in West Sussex, and in the UK at least, had officially joined what has come to be known as the "100 heartbeat club". (This term is generally applied to endangered species whose numbers have declined to such an extent, that less than 100 individuals are believed to survive.) In one particularly bad year prior to the English Nature Species Recovery Programme, it was estimated that only 50 or so adults may be surviving in the last colony. Some of this wild stock was taken to London Zoo, and several years on, after a successful breeding and re-introduction programme, the future of the Field cricket may have been secured at several sites in southern England. Field crickets are not difficult to find when they are singing, but like the Wood cricket *Nemobius sylvestris* and the Great green bush-cricket *Tettigonia viridissima*, they have a remarkable propensity for ventriloquism, and the chirp always seems to be coming from somewhere other than where the insect is finally located! On this day however, the crickets were everywhere and walked freely across the ground, as well as in the entrances of their characteristic "porched" burrows. We watched one male as it walked along a grassy margin



surrounding a small patch of bare soil. Every so often, it would raise its wings and begin to sing, completely pre-occupied by the task in hand. I found another male singing at the entrance to its burrow, but this individual, less eager to perform in public, promptly disappeared into the tunnel. I crouched motionless for several minutes before the gold-dusted cricket cautiously reappeared, to the quiet clicking of camera and the relief of aching limbs (Plate 00U). The rest of the afternoon was spent in Petworth at an exhibition given by the true master of high-speed natural history photography, Stephen Dalton.

After a night of heavy rain, the skies had cleared and the following day began in bright sunshine. We returned to Stopham Bridge to search once more for the Club-tailed dragonfly. The water level had risen to new heights and the turbulent river continued to pump sediment-laden water into the now extensively flooded water meadows. There was little to see, and we decided to travel to New Bridge near Billingshurst, another prime site for dragonflies in West Sussex. The New Bridge site holds populations of Club-tailed dragonfly, Scarce chaser, Downy emerald *Cordulia aenea*, Hairy dragonfly *Brachytron pratense*, and White-legged damselfly, and can be found where the A272 crosses the River Arun, and the Wey and Arun canal. These two waterways run side by side through grazed meadows on either side of the bridge, but on this day, neither could be seen, and were instead replaced by a flooded lake half a mile across (Plate 00S). Only a small stretch of public bridleway remained to the south of the bridge. We found several species of dragonfly along this path, and added the Beautiful demoiselle *Calopteryx virgo* and the Azure damselfly *Coenagrion puella* to our growing list of sightings. Other insects included the red-tipped metallic green flower beetle *Malachius bipustulatus* feeding on buttercup, the very large brown click beetle *Stenagostus villosus* emerging from red heartwood, Slender groundhopper *Tetrix subulata*, Dark bush-cricket nymphs *Pholidoptera griseoptera*, and three species of Cerambycidae; *Leptura* (formerly *Strangalia*) *melanura*, *Grammoptera ruficornis*, and a splendid example of *Stenocorus meridianus* (Plate 00T). These three Longhorn beetles were nectar feeding, without preference, on umbellifers, bramble blossom and wild dog rose. Before long we had come to the navigable end of the bridleway, where the swamped grass swayed to and fro at the edge of the floodwater. The gentle lapping edge of the floodwater was in stark contrast to the central churn, where the quiet meanderings of the summer Arun had given way to a boiling torrent which now forged its own direct path through fields and hedgerows. A vast shining lake of



mirrored sunlight covered the fields where Fresians had once grazed among the buttercups. For a while we stood, awestruck at the sheer power and volume of water before us. A seemingly disastrous turn of events for the dragonflies that were waiting to burst forth in full splendour from the tight dull armour that now gripped them, and for those who were anticipating that marvel. For these dragonflies, all was not lost, since studies have shown that emergence will be delayed until favourable conditions return. How those that are left high and dry in fields of receding floodwaters will fare is an entirely different matter! Having exhausted our limited options, we abandoned our pursuit of dragonflies, and travelled north-west across the county border to the fabled woodlands of Chiddingfold in Surrey.

There are several woodlands to be found in the immediate vicinity of Chiddingfold. These Wealden woodlands are extraordinarily rich in life, and provide a stronghold for many scarce species, including some of our rare and rapidly declining butterflies. They have survived the passage of time by virtue of the fact that they are situated on poorly drained clay soils unsuited to agriculture, and also provided a valuable natural resource prior to the decline of coppicing. (The spectacular decline of many of our woodland species, most notably the Fritillary butterflies, has been attributed to the cessation of woodland coppicing in this country.) Part of the Forestry Enterprise managed woodland complex, Oaken Wood and Botany Bay, now comprise a Butterfly Conservation Nature Reserve within which 35 species of butterfly are known to have bred. Among these are the beautiful Pearl-bordered *Boloria euphrosyne* and Small-pearl-bordered *Boloria selene* fritillaries, both now extinct or very rare in many formerly occupied counties. Other species of note include the Silver-washed fritillary *Argynnis paphia*, the magnificent but elusive Purple emperor *Apatura iris*, the Brown hairstreak *Thecla betulae*, Grizzled skipper *Pyrgus malvae*, and the delicate and enchanting Lady of the woods, the Wood white *Leptidea sinapis*.

We arrived at the Tugley Wood entrance and walked along the woodland track in search of Wood white butterflies. Within a few yards we came across Brimstone butterflies and that other herald of spring, the Orange-tip butterfly *Anthocharis cardamines*. We continued, past a heaving mass of Wood ants *Formica rufa* constructing a new mound, and on to a cleared area which had been newly planted with conifers (but not before I had been completely duped by a female Green-veined white *Pieris napi* along the way.) One of my less fortunate traits (less fortunate for companions that is) is a virtually complete inability to



prevent myself from launching bodily at anything that flies like a beetle or moves like a snake. I have also been told on occasion by the embarrassed parties, that the sight of a six and a half foot x 15 stone frame clearing the ground by 3-4 feet in pursuit of a beetle is enough to make you rattle your tea cup on your saucer. On this occasion, the successful sortie brought down a large Timberman beetle *Rhaguim bifasciatum* that was flying between the trees above the path. Not the sort of thing to hang on to for too long since its wood crunching mandibles can deliver a very painful nip! There were plenty of Green tiger beetles *Cicindela campestris* flying in short bursts along the path, and a few Kidney-spot ladybirds *Chilocorus bipustulatus* feeding on aphids on the young conifers. At this point we saw a lone Wood white, and further on, a Small-pearl bordered fritillary, both of which disappeared quickly from view.

Eventually we came to a small lush wet meadow full of orchids and other flowers. Almost immediately, and flying among the many Brimstones was another Fritillary, which I would have followed, but for a pretty and diminutive butterfly which in all my years as a naturalist I had not seen until that day. It was a Grizzled skipper, drinking from the tiny flowers of wild strawberry plants that hid among the meadow grasses. I watched it travel from flower to flower for a while, weaving skillfully between the grass stems, before it too disappeared into the green background.

As I wandered along the edge of the meadow among the orchid stands, I noticed a movement to my right on the layers of dried bracken. I had disturbed an Adder. I called Sara from her sketching and we crept slowly towards the bracken for a closer look at the basking snake. It was extremely camouflaged and difficult to see, its colours mingling perfectly with the background. Then, in a moment of clarity, much like the visualisation of those patterns that suddenly leap off the page to become three-dimensional images, several more appeared, their cryptic forms being de-cloaked by our trained eyes. Six or seven in total quickly disappeared into the warm bracken from the communal sunbathing site, doubtless to return when the rude intrusion had abated.

I finally tracked down a Wood white to photograph. It fluttered its dainty form in front of me, flying tantalisingly close to the foliage and threatening at every juncture to set down and be photographed. But no. It led me a merry dance, at times appearing to beat its wings so slowly and weakly that I was sure it must run out of energy and take a rest . . . like I had. In fact, by the time I had finally managed to line up



a shot, I was covered in mud and lying in a puddle, at which point a bemused rambler came over to me and said, "You're an enthusiast aren't you?" The butterfly I had been observing was a female, whose only intention was to find a suitable plant on which to lay her eggs, and which in this case was the Greater bird's-foot trefoil *Lotus uliginosus* (Plate 00V). The next hour was spent taking pictures of Brimstone butterflies (Plate 00W), and finally, with the very last frames of my last film, I managed to get close to a Small pearl-bordered fritillary (Plate 00X).

A few weeks later, we returned to the scene of the great flood at New Bridge, and in the abundance of plant growth and thriving activity, would never have known that it had taken place. On this occasion, it was the blue males of the Broad-bodied chaser and Scarce chaser that far outnumbered any females, and the White-legged damselfly and Downy emerald were plentiful.

Oaken Wood was also revisited in mid-August to photograph a strange chlorophyll-free Violet helleborine *Epipactis purpurata*, and two second brood Wood whites and many Silver-washed fritillaries were found. The Longhorn beetle, *Strangalia maculata* was present on most umbellifers, and a single specimen of its rarer cousin, *Strangalia quadrifasciata* was also encountered.

Ladybirds of Essex and Greater London

by Paul Mabbott

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The London Natural History Society and the Essex Field Club are running a survey of ladybirds. All sightings (however few and sporadic) of all species are needed: we provide a simplified key and a report form that allows drawing of unusual specimens. The survey area covers the whole of Essex and Greater London within 20 miles of St Pauls (the M25 is a very rough guide) – if in doubt, send me your records!

The first year of the survey showed a massive population collapse of most species – probably related to the weather but there are possibly other contributory factors. This is could be a useful survey and is not difficult – ideal for the novices who have never tried to identify a beetle and for experts alike.



The 1512 moth, a lesson in insect identification

by Richard A. Jones

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Birdwatchers have a word for it – jizz. Instinctively we all, as entomologists, use it even though it is only a few popular butterfly and dragonfly identification guides which formalise it in their descriptions. It is that general appearance, that first impression, that overall impact of a species when we first see it; and whether we like it or not it does truly reflect the way the human mind recognizes and identifies things in the real world.

This was brusquely brought home to me recently when I tried to identify a moth, a group I must admit I am not overly acquainted with. It flew in to a mercury vapour light I was running near Deptford Creek, a small tributary of the River Thames, in south-east London, on 23 July 1999. Spying it on the sheet (actually a rustic red and white table cloth I had purloined from the linen cupboard) I photographed what I thought looked a fairly characteristic insect. I was pleased by the resulting slide, which was crisp and clear and showed the moth in all its glorious detail.

It was now that my problems began. The photograph showed the moth's markings so clearly and precisely – its most distinctive features were the dark marks on the forewings, characteristic squiggles of black scales, edged with brown and following the split between dark grey basal background colour and pale grey distal background colour. The most eye-catching feature was the fact that these marks made the number 15 on the left-hand side when viewed one way and 12 on the right-hand side when viewed the other way (Figure 1). I subconsciously nicknamed it the 1512 moth and set about trying to identify what I thought was an obvious and easy species. I couldn't find a picture of it anywhere. I could not believe that such distinctive markings were not illustrated by any of my books.

Thwarted in my efforts, I appealed to a colleague, Graham Collins, who identified the beast as the noctuid Rosy minor, *Mesoligia literosa* Haworth. He easily identified the insect. Why had my quest for identification been so fraught with difficulty?

With the numbers 15 and 12 upon its wings, he had seen the relative proportions of the vague bands and recognized what is, after all, a rather variable species.



The moral of the tale is, of course, in order to identify an insect, you have to know how closely to look for characters and how much attention to pay them when you find them.

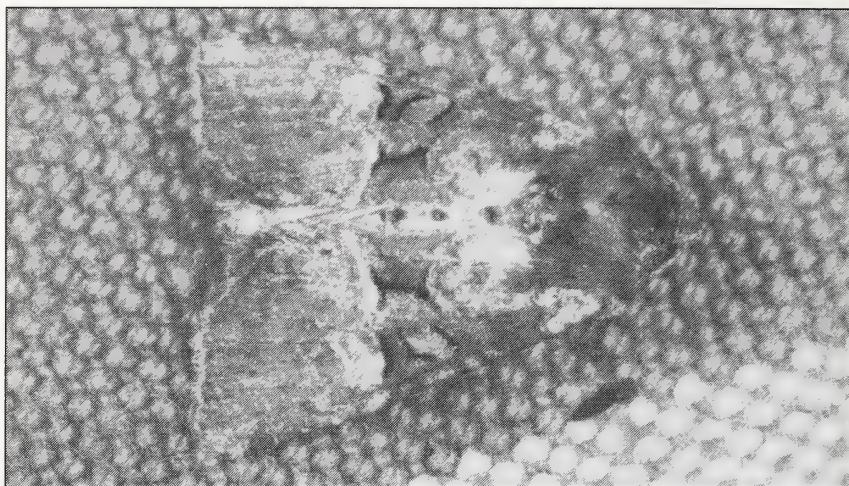


Figure 1. *Mesoligia literosa*.

Spider Sue update

by Wesley Caswell (3133)

46 Lewgass Avenue, Kingsbury, London NW9 8AS.

Some of you may remember the "Story of Spider Sue" published in the AES *Bulletin*, Vol. 54, No. 402, October 1995. Well, Spider Sue is still very much alive and kicking as they say, and is now twenty-one years old. (Even has the key to the door ...!)

The following might be of interest to others who keep tarantulas as pets. Just after Christmas I thought it might be nice if Spider Sue had something nice to eat, so I put in a few chrysalids of *P. brassicae* (Large white butterfly) from quite a large stock I have been overwintering. I thought these might emerge in the warm room after a week or so. Imagine my surprise when next morning I looked into her cage and they had all vanished!

Anyway, a day or so later I put in a few more chrysalids, this time during the day, and yes, within an hour or so, Spider Sue was caught in the act eating the chrysalids with great enjoyment (I could see the smile on her face!) and again they all vanished very quickly, with nothing whatsoever left, including the chrysalid case.



I assume they must have wriggled a bit and Spider Sue spotted the movement, or perhaps she detected some smell. I wonder if other members have even had their tarantulas eating chrysalids/pupae? – or has Spider Sue got x-ray eyes and can see the butterflies within!

I guess I'd better be careful and not put any valuable silkmoth pupae/cocoons in with her, or I could well be saying "now what did I do that for ...".

For members who have joined the AES since 1995, Spider Sue was bought for just £2 way back in 1979 at the AES Exhibition and was from Guatemala. She had her moment of fame when she was mentioned on BBC Radio 2 – and won me a Radio 2 tea cosy!

An unusual "moth trap"!

by Reg Fry (2333)

Atalanta, 26a Grange Road, Lufford, Manningtree CO11 2ND.

Like many Lepidopterists I have bred thousand of insects over the years in a favourite shed which so far has been put up and taken down in five different gardens as I have moved around the country. The window was always well open in the summer and slightly ajar in the spring and autumn. Often I have been swamped with males attracted to the scent of freshly emerged females, particularly when I was breeding the commoner hawkmoths.

However about ten years ago in early September I was very surprised to find over ten Red underwing *Catocala nupta* adults on the inside walls of the shed one morning. They were all in excellent condition and I was pretty sure they were all males (although they are not the easiest of species to sex). I had never found Red underwings in any stage locally, nor did they ever come to light there, although I had never specifically looked for them. Various theories for their attraction to this "moth trap" were put forward by fellow enthusiasts but no-one could come up with a convincing explanation.

That particular episode was forgotten until the following September when the same thing happened again on several nights running. That was the last year on which it occurred – so why did it happen? Well in both years I had large numbers of female Garden tigers *Arctia caja* emerging in the shed in September as I was persuading the rare "yellow form" to breed continuously to avoid the heavy losses that often occur during hibernation of the larvae. As a result the most likely explanation that I can come up with is that one or more elements in



the scent emitted by the female Garden tiger is also present in the scent from the Red underwing and hence the attraction to the shed. In nature of course there would normally be no such confusion because they emerge at different times of the year although there could possibly be a slight overlap.

Predation of a ladybird by an unidentified species of shield bug

by Jan Koryszko (6089)

3 Dudley Place, Meir, Stoke on Trent, Staffordshire ST3 7AY.

It is generally thought that the bright coloration of certain insects protects them from predators, warning that they are chemically defended and/or unpalatable. However, over a number of years I have observed otherwise.

It is well known that shield or squash bugs attack leaf eating beetles, and butterfly/moth larvae. This includes the larvae of the Cinnabar moth (*Tyria jacobaeae* L.). *Picromerus bidens* is known to attack the larvae of the Cinnabar moth, sucking the juices from the caterpillar. Yet the larvae is distasteful and brightly coloured and left alone by other predators.

I once saw a Common or Green tiger beetle (*Cicindella campestris*) with a ladybird in its jaws. I have also seen them in spider webs.

During July 1994 whilst walking through Weston Sprink Wood, Staffordshire at around 3.30pm on a warm and sunny day, I noticed a ladybird which had been killed on an oak leaf. Next to it was an unidentified species of shield or squash bug. This carnivorous insect had pierced the ladybird with its sucking mouthparts forming a beak to suck the juices. I put the predator with its prey into a container. The bug just carried on feeding undisturbed.

On my way home I ran into an entomological friend, Mr Derek Heath, to whom I showed my find. He offered to photograph the insects so I left them with him. He took them home and placed them on a leaf for the photograph, but the bug let go of its prey and walked off. Derek was most disappointed, but to his joy, a few minutes later the bug returned and carried on feeding, its beak being inserted into the same wound hole. It carried on feeding for another two hours and then left the dead husk. I have now got the picture of them on a slide.

I would welcome other observations from members – no doubt quite a list could be compiled.



Soil fertilisation by Noctuid larvae

by John Notton (5459)

16 Crawshaw Drive, Emmer Green, Reading RG4 8SX.

I am not inclined to view lawn maintenance in my suburban garden as a high priority activity. However, when the amount of moss exceeds that of grass, some action must eventually be necessary! After a mowing session on 19th April 1999, some mossy patches were vigorously scarified with a spring-tined rake. Among the moss debris from about two square metres of lawn I found a number of Noctuid larvae of a sort I had not seen before, and I decided to try to rear them. Reference to *The Colour Identification Guide to Caterpillars of the British Isles* by Jim Porter suggested that the larvae were mostly of the Heart & club (*Agrotis clavis*), although similarities to pictures of larvae of several other related species did not allow these to be ruled out at that stage. *A. clavis* is also regularly taken in some numbers in the MV trap which I run in the garden.

The method I adopted is as follows:

About four centimetres of soil-less garden compost was placed in a large plastic container and a layer of the moss debris was placed over half of the compost surface, together with dandelion leaves as food on the other half. A larva-proof ventilated cover was placed over all and a total of 14 larvae were introduced. The moss was occasionally lightly sprayed with water in dry weather periods.

After recovering from their initial passive state, the larvae burrowed into the compost. Dandelion was readily accepted, with feeding taking place very largely at night. Sometimes the dandelion leaves were partially drawn into the larval burrows and those leaves were sometimes seen to be eaten during the day. By 4th May the larvae were apparently all fully fed – as measured by the lack of food consumption. When the moss and food debris were removed, three larvae were seen to have pupated on the surface of the compost. These were removed to an emergence cage.

I particularly noticed that the surface of the compost was free of frass and investigation showed that each larva had packed its frass into the bottom of its burrow. This led to fears about losses of the buried larvae or pupae due to mould or bacterial infection. The eleven remaining larvae were therefore carefully dug up and transferred to some fresh compost where they quickly re-buried themselves. Some fresh food was added as a precaution but very little was taken at this stage. The whole container was placed in an emergence cage and results awaited.



Of the three surface pupae the first to emerge on 15th May was a Setaceous hebrew character, (*Xestia c-nigrum*), followed by *A. clavis* on 14th June and another on 15th June. Of the subterranean pupae, five more emerged on 18th, 22nd, 23rd, 24th and 27th June respectively and were all *A. clavis*.

On 1st July, I investigated and found that all the six remaining pupae were dead. Two had died because other larvae had tunnelled through them and one of the "tunnellers" had also perished. The cause of death for the others was not established.

The most interesting point which comes out of this exercise is the effect that these larvae could have in the natural cultivation of the soil, an action which may complement that of earthworms.

Although the soil under my lawn is no doubt more solid than compost from the bag, the larvae have a surprising ability to dig. In this case, not only do they help to make the soil more porous, but they actually place their frass as partially composted matter in packages at a little depth where it can be of direct benefit to plants. At seven larvae to the square metre, their efforts will not be earth shaking by comparison with earthworms, but there is no guarantee that I found all that were in my mossy areas!

There are some lessons here for someone wanting to rear these larvae. The method seems to have been successful up to the pupation stage as the larvae appeared fat and healthy. In future it would be better to put fewer larvae in one container to guard against accidental damage. I hope to try again next year – a good excuse for leaving the moss in the lawn! When I do try, I will not transfer all the larvae away from their frass to see if it could actually have some benefit for them.

Some Noctuid larvae are well known for burrowing and others live concealed amongst roots. Among moths most closely related to *A. clavis*, the burrowing habit is mentioned by Porter for the Coast dart (*Euxoa cursoria*) and the Portland moth (*Actebia praecox*), both of which burrow in sandy soils. However, the habit is not specifically mentioned for moths of the genus *Agrotis*, although it can be inferred in some cases from the details given.

So far, I have found no text which refers to this soil-fertilising action by ground-living Noctuid larvae in general, or by *A. clavis* in particular, or to its possible ecological importance. I would be most interested to hear from anyone who has made similar observations or who already knows of the ecological effect and can direct me to an appropriate reference.



Entomological ramblings

by Graham Best

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In the darkest, early years of the Second World War all along the south coast eyes and ears were strained for invasion from the continent. There was much talk of "Fifth Columns" as they were known, of sympathisers waiting to aid invading forces. In the hysteria being an entomologist with our secretive ways must have been very hazardous, indeed some were arrested as related by Hugh Newman in *Butterfly Farmer*.

Meanwhile arrangements were being made by unwitting citizens backed by the government to aid another sinister, damaging but this time successful invasion from the continent – the Cabbage white butterfly, which augmented, in some years, our own native population. With food convoys being sunk in the Atlantic every effort was made to grow our own food and gardens and parkland including Buckingham Palace and Hyde Park were turned over to allotments in which one of the chief crops was cabbages. The various species lumped together under the name Cabbage whites were regarded as such a threat that at annual flower shows prizes were given to children for the most corpses that they could display.

Having their very own plot of land to till appealed to many and allotments continued long after the war and to this day. I was fortunate in having such a plot opposite where I lived and my burgeoning interest in butterflies was encouraged by allotment holders who were only too pleased to have someone to pick caterpillars from their crops. I soon learned which ones were Large whites though the difference between Small and Green-veined whites eluded me for a while.

Opposite the allotments was a rough brick wall and in the autumn this was combed for the large, angular, boldly spotted chrysalids of the Large white with its shape of things to come etched in the rigid casing. From the few books available I read about "forcing" and every day through the insectless days of winter I watched and waited for that time when wing patterns became evident under the frail chrysalis skin. Just occasionally I was lucky enough actually to see that magical moment of an emergence and to watch as wings were inflated and the beauty that, even in a Cabbage white, only a freshly emerged butterfly has.

Since those stumbling, transportless early days I have travelled around this country and seen and bred many of its rarest indigenous species, travelled abroad and seen and bred some of the species that for some



mysterious reason are included in every list of British butterflies but I still retain happy memories of those simple pleasures that brightened up those grim and austere post-war years.

Instead of, as some do, joining the ranks of old men at toy fairs trying to recapture childhood memories I sought instead, but in vain at Kempton Park this year, for Large white pupae. Must set to and sow some Sweet rocket seed. Never could stand the smell of cabbage!

Some notable Staffordshire Lepidoptera records at light and sugar, 1999

by Jan Koryszko (6089)

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One Chamomile shark *Cucullia chamomillae* D.&S. flew into my kitchen attracted to the light, on the evening of 4th April 1999 at the Meir. It is uncommon in North Staffordshire.

One Waved umber *Menophra abruptaria* Thunberg at homemade light trap, run at Meir by Derek and Richard Heath on the evening of 3rd May 1999, again uncommon in North Staffordshire.

Two moths, Small clouded brindle *Apamea unanimitis* Hübner at sugar, Meir, by Derek Heath and myself on the evening of 5th August 1999. A rare species in North Staffordshire. I have recorded this species from Barlaston Rough Close Common and Western Sprink in the past few years, but only single examples in the marshy areas. The Meir area lies close to both these locations, these were the only two Meir records so far.

The Broad bordered yellow underwing *Noctua janthina* D.&S. and Lesser broad bordered yellow underwing *N. fimbriata* Schreber were very common at sugar during July and August 1999. Most years in the Meir area these two species are uncertain in appearance and other years become common. The Old lady moth *Mormo maura* Linnaeus and Red underwing *Catocala nupta* Linnaeus were not recorded at sugar during 1999 in the Meir area, but most years they are only recorded in very small numbers. Svensson's copper underwing *Amphipyra berbera svenssoni* Fletcher was also down in numbers with only single examples at sugar and one at a lighted window at Meir, all from late July to late September. Maybe last year's (1998) poor summer could have been the reason for the smaller numbers.



Ephemeroptera Recording Scheme Press Release

The Ephemeroptera Recording Scheme has been set up under the auspices of the biological records centre at Monks Wood, to encourage the recording of the Ephemeroptera species throughout the British Isles. The principle aim of the scheme is to collect records of Ephemeroptera. This will allow distribution plans to be compiled and changes in the distribution of Ephemeroptera populations to be monitored.

The Ephemeroptera, or Mayflies as they are more commonly known, are a small order of insects with only eight families and 47 species recorded from the British Isles. They are aquatic in the larval stages and are found in almost all freshwater habitats. As a result they rely upon clean aquatic environments for their development.

The larvae of some species can take up to two years to mature but most species complete their life cycles in one year and some have two generations a year. All British Ephemeroptera are herbivores and feed by a variety of methods on detritus and algae on stones. Their growth is by a series of moults where the outer skin is shed. Some species can perform this moult up to 27 times before emerging as the winged adult.

The adults are soft-bodied insects with very short antennae and two or three long tails. Most adult Mayflies have two pairs of wings, however the hind pair are considerably smaller than the fore and in some species are absent altogether.

Mayflies are unique amongst insects because the adult, within minutes or, at most, hours of emerging undergoes a further moult to a second winged stage, the sexually mature imago. The imago is usually brighter in colour than its sub-imago, with translucent wings and longer tails. The winged stages do not feed, and live for only a few days at most.

The Ephemeroptera Recording Scheme is looking for any records of Ephemeroptera species from all over the British isles. Adult Ephemeroptera can be collected throughout most of the summer, while the aquatic larvae of many species can be found during the winter, so that recording can be carried out all year round.

If you have records of Ephemeroptera species or you want to know more about the Ephemeroptera recording scheme then contact:

Ephemeroptera Recording Scheme

c/o Craig Macadam, East of Scotland Water,

Pentland Gait, 597 Calder Road, Edinburgh EH11 4HJ

Tel: 0131 453 7508 Fax: 0131 453 7508

E-mail: craig.macadam@esw.co.uk

Website: <http://www.ephemeroptera.brittanica.freesevers.com>



Migrant or Over-wintering Butterflies and Moths in Kent

by Chris Orpin

The winter of 1999/2000 was warm with frosts (to -2°C) only on about ten days in Brenchley, Tonbridge, Kent with no prolonged periods of cold or wet weather.

Red admiral was observed on sunny days at least once a month from November to April in my garden.

On March 17th I observed a Hummingbird hawkmoth. Both species were observed in September/October in the garden. The aspect of the garden is south facing and very sheltered with a wide range of flowering plants. It would seem likely that Red admirals can hibernate in the UK in these warm winters. However, I am not sure whether Hummingbird hawkmoths are also capable of hibernating but March 17th seems exceptionally early for a migrant. Any feedback would be most welcome.

An unexpected attack by the parasites!

by Reg Fry (2333)

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Most of us who enjoy breeding insects are sometimes disappointed, but not too surprised, when wild caught larvae, pupae and even ova yield one or more parasites when they should be changing to the next stage. All stages are at risk, as illustrated by the following specific examples from the butterflies, which I have copied here to set the scene for those who have recently taken up breeding insects (an extract from Dickson, 1992). "The White Admiral butterfly, *Ladoga camilla*, has a parasitic wasp of minute proportions which lays its eggs in the butterfly's egg deposited on the upper surface of a honeysuckle leaf. The parasite larva devours the contents of the egg and instead of a caterpillar emerging from the egg there issues a wasp. The same butterfly has another enemy, a wasp of the genus *Meteorus* (Braconidae) which lays its egg in the small larva soon after it hatches. This parasite spends the winter inside the host and in the spring, soon after the caterpillar starts to feed again, the parasite bores its way out of the dying caterpillar, spins a thread and from this it makes its cocoon. However the most devastating parasites for the breeder of butterflies are those chalcid wasps which lay their eggs on or in the soft pupa immediately after it



has emerged from the last larval skin. The commonest of these is called *Pteromalus puparum* (L.). It is gregarious and often the female wasp can be seen sitting on the back of the fully grown caterpillar, waiting for it to change into a chrysalis”

When breeding insects in captivity we expect to be able to avoid any such problems after we have reared the first generation to the adult stage, particularly from the larger parasites. There is always a risk that the tiny chalcid wasps (some less than 2mm long) can get through small cracks in cages and coarse netting but usually we manage to keep both Hymenopterous and Dipterous parasites at bay.

This is not always the case however and I was reminded of other, less obvious, risks when I was captive breeding the “yellow” form of the Garden Tiger, *Arctia caja* a few years ago. On several occasions when checking that the larvae had successfully pupated I was surprised to find the brown puparia of one of the Tachinid flies alongside dead *caja* larvae. This has happened on a few occasions before with other livestock but whilst I made a mental note of it at the time, it was several months later that I decided to read up on the life history of the Tachinids to find out how these parasites managed to attack my livestock.

There is not a great deal of published information which is readily available on the parasitic Tachinids, although the AES publication *A Dipterist's Handbook* gives a broad description of the ways they attack Lepidoptera and other Orders (however I hope that the AES will be able to produce a more detailed leaflet on this topic in the next few months). Most parasitic Diptera do not possess the sort of ovipositor that allows them to pierce the skin of other insects and most Tachinids lay their eggs on or close to the larva they hope to parasitise; for example, *Carcelia lucorum* is known to lay eggs on the hairs of the Garden Tiger and the parasite larvae burrow through its skin when they hatch. However this can usually be ruled out for captive bred stock because the flies are relatively large and should not be able to gain entrance to well maintained cages.

How then were my *caja* larvae attacked? Well I was continuously breeding the larvae, feeding them on dock for most of the season and so-called “spring greens” from late autumn to spring. The parasite attacks occurred during the time that the larvae had been feeding on dock and the most likely source is from a species such as *Pales pavida* (Meigen) which lays thousands of eggs at random on foliage in the hope that a few of them will be eaten by larvae. These species (e.g. from



the subfamily Goniinae) lay from 2000 to 6000 eggs which are viable for up to six weeks and are very small (less than 0.2mm); the eggs are ingested by the larvae as they consume the foodplant.

It is perhaps surprising that these occurrences are fairly rare even when breeding large numbers of larvae in captivity (unless you have found it to be otherwise!). In the case of the caja larvae, I was picking dock leaves from a small paddock almost as fast as they were growing to maturity so that there must have been a good chance that any eggs laid on the dock would be picked up with the foodplant. In addition when breeding such large numbers of larvae there is a much greater chance that every leaf will be consumed in its entirety and hence any parasite eggs deposited would have a very better chance of being ingested than in the wild.

There is still a need to record parasites emerging from Lepidoptera and even more so from other Orders (Shaw, 1997) and I regret now that I did not record how many flies (if more than one) had parasitised each larva and that I did not send the flies off for a positive identification. The AES has two advisors who welcome specimens for identification, providing accurate details are given of the host species – date of capture, location and foodplant. It is essential that you are accurate in establishing which insect host the parasite emerged from and that, for example, it did not turn up in your breeding cage from cocoons already on leaves or deep within a potted foodplant (send the remains of the host also if possible). Particular care should also be taken in packing the specimens to ensure they are not crushed or shaken to bits in the post and please remember to enclose a stamped addressed envelope for a reply. The current AES advisors are:-

For Hymenoptera: Dr. Mark Shaw, Royal Scottish Museum, Department of Natural History, Chambers St., Edinburgh EH1 1JF

For Diptera: Tom Ford, 39 Ashbury Drive, Sheffield, Yorks S8 8LE.

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PLATE 00Q. Broad-bodied chaser *Libellula depressa* at Stopham Bridge, West Sussex.
(Sutton, One weekend in May . . .)



PLATE 00R. Scarce chaser *Libellula fulva* at Stopham Bridge, West Sussex.
(Sutton, One weekend in May . . .)



PLATE 00S. The flooded scene, New Bridge, West Sussex.
(Sutton, One weekend in May : . .)



PLATE 00T. *Stenocorus meridianus*, New Bridge, West Sussex.
(Sutton, One weekend in May : . .)



PLATE 00U. Field cricket *Gryllus campestris*, near Petworth, West Sussex.
(Sutton, One weekend in May . . .)



PLATE 00V. Wood white *Leptidea sinapis*, Tugley Wood, Surrey.
(Sutton, One weekend in May . . .)



PLATE 00W. Brimstone *Gonepteryx rhamni*, Tugley Wood, Surrey.
(Sutton, One weekend in May . . .)



PLATE 00X. Small pearl-bordered fritillary *Boloria selene*, Tugley Wood, Surrey.
(Sutton, One weekend in May . . .)



Clearwings

by Maurice Pledger (3928)

19 Granville Gardens, Hoddesdon, Hertfordshire EN11 9QB.

With the impending arrival of spring 1999, my thoughts as usual, turned to clearwings. I have always had a great fascination for this family of elusive day-flying moths. Over the past few years it has become more and more obvious to me that in order to actually see the adult moth, a lot of fieldwork and patient searching has to be undertaken. Unless you actually go out of your way to search for these moths in the early stages of their development, I would say the chance of bumping into one casually is almost nil. Having said that, my first brush with a clearwing involved an unbelievable piece of luck when I was chopping down some *leylandii* trees in our small back garden in Hoddesdon. I was on my knees clearing up the resultant carnage when I noticed a small wasp-like insect in the grass. Cupping it in my hands I hoped against hope it was indeed what I thought it was. To cut a long story short, it was in fact a Currant clearwing.

From then on, over the next few years my interest slowly grew, having limited success here and there, but to be honest it became painfully obvious that if I was to increase my clearwing list, as it were, a lot more spadework would need to be done.

At this point, I must say I am forever in the debt of my two good entomologist friends, Phil Jeffery and Rob Dyke, without whose expert knowledge and guidance I would still be stumbling around cutting down every *leylandii* tree in existence, in the vain hope that all the other species of clearwing would be as stupid as that first one. What the hell that one was doing in my garden is still totally beyond me.

Having set the scene, I feel that I must apologise here for being blessed with the most unbelievable luck sometimes. It is painfully embarrassing after having been handed down a lifetime's knowledge on a certain subject, to go out and within five minutes stumble onto something which they have been years looking for. This, I'm good at apparently. Through no fault of my own I might add.

Anyway, as most of you probably know by now, I spend a great amount of time taking Bunny, my American Cocker Spaniel for walks in the countryside around Hoddesdon and in the nearby Broxbourne Woods. While he's having a good sniff round, I am on the constant lookout for all good things concerning insects, and particularly this winter, evidence of clearwings. A fair amount of the time I've joined up



with Rob and Phil, and through patient observation and their knowledge, we've managed to track down quite a few clearwings. It's been great fun, and for what it's worth I thought a few words on our exploits might be of interest to someone. I'll take each species that we've had success with this year separately, so as to make it a bit clearer – hopefully!

Red belted clearwing

Phil has been handed this one on a plate as there's a crabapple tree smack in front of his house in Broxbourne, which is riddled with them. The old exit holes remain in evidence permanently on the trunk. The area affected is mainly up one side of the trunk and going up the undersides of where it branches off, about head-height. On the 15th June this year we noticed the first pupa protruding from the scaly bark, and then subsequently and with more frequency, the hotter the weather became, with each passing day we would find more. Amongst all the exit holes (which are about 3-4mm in diameter) you can see the new capped holes which are awaiting emergence. I'll get back to these in a minute. On the 28th September 1998 I found two pupae cases protruding from old hawthorns, one in St. Margaret's Community Woodland in Hoddesdon, and another one on the 100 Acre Estate, also in Hoddesdon where I live. Apparently the Red-belted clearwing occasionally use hawthorns as a site. These I would think are very few and far between and at very low density as only single pupae were found.

On the 16th June 1999 at 3pm I was passing the tree on the estate with Bunny and I thought I'd look and check to see if I could find another. Literally one second later an adult Red belted clearwing settled on the bark right in front of my nose. I searched for a pupa case and found one, among some old exit holes of the buprestid beetle, *Agrilus sinuatus*. There, nearby was what seemed to be a capped hole. I carefully prised away the surrounding bark and found immediately below the cap, on the underside of the thin surface bark layer a cocoon. The following day this hatched into a glorious adult.

I went back to Phil's tree, chose a capped hole, prised off the bark again and immediately behind the cap was a cocoon but unfortunately the pupa had been eaten by something. I left the others to get on with their own devices, however, it seems that this is a very good way of ensuring fresh hatched adults. My brother-in-law who lives in Hertford Road in Hoddesdon also has the good fortune to have an old apple tree in his garden which is infected with this clearwing. Adults being seen on both trees either late morning or afternoon on hot sunny days.



Large red belted clearwing

From the 21st February 1999 onwards, Rob and I had been searching for these wonderful clearwings at two sites which Rob knew about in the past. One was at Wormley Woods near Beaumont Manor, and the other at Bencroft East, an area of coppiced woodland in the Broxbourne Woods complex right where I'd been doing all my bupestid hunting the previous year. Here Rob showed me how to look for signs of their occurrence, and now thanks to him I can almost count myself a qualified searcher. From knowing absolutely nothing about this clearwing Rob showed me how to look for silver birch trees which had been coppiced two years ago (the larval stage of this species is two years). Evidence of larvae shows as tiny piles of frass exuding from between the outer bark and hardwood at the top of the stumps. If you carefully flick this away you can see the tiny hole from which the moth will eventually emerge in the spring. Obviously there comes a time when the larva is ready to pupate, and apparently just before this stage is reached, it will cap the hole. Any remaining frass sometimes gets washed away in the rain or gets knocked off by birds *etc.* leaving a very unobtrusive capped hole. Some are more obvious than others, and frequently the holes are situated a few centimetres from the edge actually in the hardwood. A few trips involved searching among these two year old stumps, and gently rubbing the stump tops with wire brushes, to locate the camouflaged holes. The best area was Wormley Woods where Rob had noticed tree-felling two years previously, along one of the woodland paths. The area being nice and open with the stumps receiving a fair amount of sunshine, something these day-flying moths revel in. With a fair bit of practice, it becomes easier to see if an area is "clearwingy" or not. I think the essential factor being that the area receives a good amount of morning and afternoon sunshine, and isn't too closed in.

When we found our stumps with capped holes the next step was to either saw off the top about three or four inches down, or chisel out a section around the hole. Great care has to be taken so as not to cut or chisel too near where the pupae were about 24-30mm below the exit holes. With this in mind we carefully skirted around the suspected pupal area. These stump tops and sections were taken home and placed in airy containers in damp sand. We fared quite well with most sections giving successful emergences with some absolutely stunning adult clearwings. My first emergence, admittedly from a section which had been kept indoors, was the 27th March. The second was on the 30th April and from then on, we had a few more hatch in quick succession. Most of mine emerged about



2.45-3.30pm in warm sunshine. In one stump top we found six exit holes, but unfortunately only two emerged from this. We noticed that in a long area of felled silver birches of say, 100 yards or so, there was definitely a favoured area of stumps in close proximity to each other which were tenanted. Affected stumps would peter out in number the further away from the "hot" area. On the 6th May we found two fresh pupae cases "in the wild" at the Wormley site. I did well with both stumps and sections which were kept in sand indoors and outdoors, placing them in the sun for a few hours each day.

Lunar hornet moth

Rob and I did well again with this secretive moth.

At the same Wormley site a little further along the same path, was an area of felled willow trees. Both stump tops and odd sections of cut trunks which were left lying around contained evidence of the tunnelling of the large larvae of Lunar hornets. Again Rob showed me the affected stumps with the large holes, sometimes up to three or four in a single small felled tree. I began to see what he was telling me about how the larva goes up and down the trunk a fair way, and down into the roots. When the tree is felled just above ground level, in effect the tunnel is "cut in half", and you can see a cross-section. If the larva is still in there, it could be either in the trunk which has been taken away, burnt or whatever, or below the stump top, and any distance down into the roots. A problem. Some tunnels were old, with an exit hole already in evidence on the side of the stump where the moth emerged. Obviously had the tree been still standing, it would have naturally exited from a hole in the side of the tree, normally at about ground-level or just above. We found no exit holes, capped or otherwise in any standing trees we looked at in these areas. We went round a few with the wire brush but had no luck. We cut and took a few stumps but these came to nothing as the larvae were "not at home". However, we found a new area frequented by lunar hornets at a coppiced area at Broxbourne West which was being cleared to encourage nightjars to return. This area had been cleared a few years ago, but there was evidence of recent coppicing still going on. We noticed a stand of recently felled willows which were absolutely riddled with tunnels. We sawed and chiselled at many stumps and came away with three "definites". Rob took away a lovely pupa in a thin section which he'd cut away, and I took two. One contained a recently formed pupa, and another containing a still active larva which was still throwing out frass (28th June).



Finally my pupa hatched on 12th June but its wings unfortunately got tangled despite all my best efforts. I kept her alive for a few days and let her go in my garden where I last saw her sitting in a young *Buddleia* bush.

Again, some trees within a favoured area were riddled with tunnels, while others remained untouched. Some new growths of willow only one inch in diameter, cut at ground level contained larval tunnels. We also saw a few affected stumps and trees at the Taylors Lake Fishery in Pig Lane, Bishop's Stortford, and a couple of trees at Cheshunt pits. Woodpeckers had found out about these ones and had set about looking for the larvae. A few old exit holes on these trees were about a meter up the trunk. Given that the tree was actually growing in the water at the lake edge, they obviously wanted to keep their feet dry.

Red tipped clearwing

With this one I get painfully embarrassed to the point that I want to crawl away and hide. Rob had told me this is an extremely local moth and not really recorded from this area. He'd been successful with a couple of adults reared from *Salix viminalis* years ago and from another area. Very occasionally the moth had been recorded as secondary tenants of excrescences on willows. He'd spent years on his many long walks around the country breaking open hundreds of these growths with no luck whatsoever. Now, the day in question, 13th February, found us walking round Cheshunt Pits near some willows on which were growing these excrescences in large numbers, on the branches. He'd opened up loads over the years on these trees and found nothing. To show me what we were looking for, he broke one off and opened it. I then snapped off the next one along the same twig, and opened it up, whereupon an old intact pupa case fell out. If my embarrassment wasn't painful enough, the look on Rob's face was. Subsequent checking under the microscope showed it was indeed a clearwing pupa case which hadn't hatched. Nice one, and a definite record for a clearwing not recorded in this area before.

Now, with this in mind, 11th April saw Rob and me on one of our many local walks, this time along Ermine Street at Elbow Lane at the entrance to Ball's Wood near Hertford Heath. Walking along we noticed a straggly willow tree near the path, on which were growing a few of these excrescences on the thin twigs. First one I grabbed had powdery frass coming out of it. Rob's face again suggested once again I'd stumbled onto something worth keeping. Something was definitely still inside, a larva of some kind, so I took it home and sleeved it up in



some damp sand, along with all my other bits and pieces. On 29th May, upon returning from a trip to Folkestone Warren and Dungeness with Rob and Phil, I glanced in the container and saw a lovely fresh Red tipped clearwing, with the pupa case still in place on the excrescence.

Subsequent cracking open of these growths has revealed nothing, but the time for this should be around early spring when fresh frass would be issuing, as in this particular case. The twig with the growth still attached should then be taken and sanded up, to await, hopefully, a successful emergence.

Currant clearwing

Apparently, according to recent books, this clearwing isn't as common as it once was. The foodplant of the larva is black and red currant and sometimes gooseberry. We think that due to the demise of many allotments on which these bushes are cultivated, the moth has suffered as a consequence. Over the last three years I've visited various pick-your-own fruit farms in the hope of seeing adult moths, or evidence of larvae, but to be honest I didn't really know what I was doing and what to look for. There is enough written in books describing this moth and it's life history, but there really is nothing to compare with actually being out in the field looking first hand. A great deal was learnt as we went along, by Rob and me on this species.

Getting back to PYO farms, Phil rightly suggested that as these places are probably regularly sprayed with various chemicals, there wouldn't be much chance of finding clearwings there. At this point I nearly gave up. However, when he suggested the best thing to do would be to look for old allotments, which obviously wouldn't be sprayed on a large scale, I perked up a bit. Given the moth is still around, I thought I might still be in with a chance of tracking it down. Last summer I paid a couple of trips to a small worked allotment in Pindar Road, in Hoddesdon at the edge of an industrial estate. The allotment had been there years, and after gaining permission from the owner, I spent an hour or two just watching, hoping to see flying adults. No luck.

On a whim, on 9th May 1999, I went to look at the currant bushes at this allotment. On arriving at the bushes, which were already in leaf to some extent, I knelt down, and on the very first twig I looked at, I noticed a small scar about half way along, on one side. I bent the twig back on itself, whereupon it broke off. I split the broken stem and saw that the inner pith was black. Looking back at the other piece, I noticed a small wriggling orange-yellow pupa case wedged in the centre of the



stem. The scar was in effect the future exit hole, and the pupa waiting to emerge. I took the twig, along with a few others that I suspected contained pupae and sleeved them up in damp sand as usual. This particular one emerged on 26th May. Rob and Phil were told with much jubilation I might add, as neither of them had had any luck at all with this moth. I returned with Rob to this allotment, and after making a few enquiries here and there we visited other allotments that came to our attention. Another very good site was the extensive area of worked allotments at Cromwell Road in Hertford, alongside the railway line. Also the old disused Farnham Road allotments off the B1004 Rye Street in Bishop's Stortford. I hasten to add that permission has to be gained from owners, as a certain amount of cutting and slicing of stems has to be done to ascertain if the bushes contain this clearwing.

Apparently the eggs are laid on the exposed pith of recently pruned stems, and the larva tunnels in the stem. First signs that a bush contains or contained larvae are old exit holes all over the place on all ages of stems. If the bush contains old withered pruned stems which are still left in place, it's a good give-away as the old exit holes are very evident.

Given that you've found a bush with old holes evident, then the next step is to look amongst the newer stems. Sometimes the newer exit holes aren't that easy to see as on occasions there is a very thin layer of "skin" covering them. If the allotment is disused or the owner grants permission, then the slicing of stems comes into play. If the pith of a sliced stem is light in colour, then there hasn't been a larva in that piece. If the pith is black, then you have to look either side of the cut to where the pupa will be situated, awaiting emergence under the exit hole. Depending on the thickness of twig these larval tunnels can be surprisingly long, especially in the thinner ones. Once you have located the exit hole it will be evident that the larva tunnel goes above it and below it. Often the exit hole will be the pruned stem end itself, and no exit hole in the side of the stem will be found.

At the time of writing I have no observations of looking for larvae when apparently frass is being issued from pruned stem ends or cracks in the bark, as Rob and I started looking late in the life-cycle and the larvae had all turned to pupae. Adult moths began emerging from cut stems on the 25th May onwards.

Orange tailed clearwing

The "foodplant" of this lovely clearwing is the wayfaring tree and also the guelder rose. Given that neither of these trees are actually that common in this area, and then obviously not every tree will contain



them, then the odds are really stacked against you. These trees are more common on chalk and on a day's rambling at Folkestone Warren you will find more wayfaring trees than you have ever seen. Walking around the Broxbourne area you bump into the odd tree here and there, and as already mentioned, like as not, the clearwing isn't there anyway.

Last summer Rob showed me a very famous old guelder rose near Goose Green in Broxbourne Woods growing in a watery ditch. A very established tree, there are many old exit holes going back years which have enlarged with time, and are very evident. Rob told me the best time to look for signs of this clearwing is in the winter before all the new leaves cover and hide the branches. What you are looking for here are swellings along the twigs and circular capped exit holes. These caps, about 7mm in diameter, are frequently found just below a fork in the twig. Sometimes the caps fall off leaving a small exit hole surrounded by frass underneath. After careful searching on this tree Rob found two and gave them to me to sleeve up in sand. One collected on the 18th May emerged on the 14th June.

Also Rob had found a straggly few branches of wayfaring tree in Balls Wood along Ermine Street near the edge of a field. He'd noticed it on one of his many walks in the area and had seen the odd exit hole so thought it was worth checking out. We found no new ones but Rob noticed a trimmed hedge nearby alongside a ditch, which consisted of various hawthorns and other things but also had some wayfaring trees tangled in as well. He found old exit holes and a capped hole on a stem. This he again gave to me to look after and it successfully emerged on the 16th May. On the 29th May, Rob, Phil and I spent a day at Folkestone Warren in Kent, along the cliffs. There are so many wayfaring trees you wouldn't believe it. Although the odd one contained old exit holes it was like looking for a needle in a haystack. Within ten minutes of arriving, after a long trip in the cars I just had to find a quiet spot off the beaten track – too many bottles of Lucozade I suppose. While I was standing there, the first thing which caught my eye was a single twig of wayfaring tree growing from the ground, about 10mm thick, and about a metre from the ground was the most classical example of a capped hole you would ever wish to see. Again, it was sanded up and emerged on the 24th of June.

The interesting thing here is that when I split the stems after the moths had emerged, to see what was going on inside, I found no larval tunnelling at all below the exit hole. What tunnelling there was, was above it with the pupal chamber situated about 7cms above the hole.



This was in stark contrast with the Red belted clearwing on the apple and hawthorn trees where the pupal chamber is attached to the underside of the thin cap.

Six belted clearwing

For the last three years Phil, Rob and I have been returning to the old disused chalk quarry at Upper Sundon near Luton in Bedfordshire. A sprawling area of natural chalk, chalk cliffs and a series of small ponds where people fish. A wonderful area. The spot was told to me by Jim Porter who knew of it from way back, and said that the best time to look for this clearwing was the first two weeks in July. Last year on 4th July, Rob and I swept a dozen adults from the vast areas of bird's foot trefoil. This year on the 26th of June I found none at all. Rob and I returned on the 10th July and two or three hours sweeping yielded only one, however, it brought my tally of clearwings for 1999 to seven species. The trefoil had peaked and was beginning to wane, suggesting that perhaps we were too late, the clearwings may have been out slightly earlier during 1999.

Hornet moth

Again Jim Porter told me about the Hornet moths which are to be found on the poplar trees at the Barton Mills roundabout on the A11. I'd taken a couple of trips both in 1999 and 1998 to look at the old exit holes and cocoons at the base of the trunks. Rob already knew of this location and had successes in the past. On my trip in 1998 I'd discovered a "new" area of undisturbed poplars, and it was here Rob and I went in 1999 with his good friend John Fenn. We had a nice poke around and saw many old exit holes and cocoons.

On 8th June while Rob and I were walking around the Taylor's Lake Fishery in Pig Lane, Bishops Stortford, Rob suggested we look at the only tall black poplar tree on the fishery. Low and behold, there at the base of the trunk were old exit holes and a couple of old cocoons. Nice to know they are a little closer to home, and another location on the map for Hornet moths in Hertfordshire.

Just to round off the clearwing hunt for 1999, I added another species to the list, but this time unfortunately, abroad in Menorca. The usual family summer holiday saw my wife, daughter and me sunning it up somewhere far away, my son deciding to stay at home. Anyway the usual scenario with our holidays is to descend on a beach somewhere,



or even stay by the pool at the apartment, Pietra and Laura doing all the normal holiday things, while I ramble off, net and pots in hand to see what I can find in the area.

The day in question, 24th July, saw us on the sandy beach at Son Xoriguer on the west coast near to where we were staying. Just behind the beach was a line of hotels and bars separated by a narrow cement path bordered by all manner of Menorcan shrubs and plants. Some of these I was already familiar with, some I wasn't. There were as usual lots of various coloured *Oleander* shrubs, but to be honest I've found these never attract anything more than a few different wasps. There were other shrubs which at a first glance to me anyway, suggested a kind of fir. Talking to Rob on my return, he told me they were tamarisk shrubs, but at the time, I hadn't a clue. Ever hopeful for a clearwing (or buprestid come to that), most of the these little wasps invite closer inspection, just in case. As I said before, it's very rare to actually see a clearwing flying, and their characters differ from other insects, so at times a tiny hovering wasp, blown by a gentle breeze, could look sufficiently different to court a second look. Anyway, passing a stand of these shrubs, I noticed a section without too much foliage. As it turned out, two or three main branches and stems were either dead or very sickly. I leaned over and had a closer look and noticed three kinds of holes which were all over the place on these dead or dying branches. Firstly, there were hundreds of tiny pin-holes which I took to be of woodwormy-type things. Then, here and there, were a few neat holes about 3-4mm in diameter. Lastly, a few odd ones of about 10mm across. Again, the larger ones I thought just would have been beetles. The middle-range ones, well, who knows? At this time I was still thinking beetles, whereupon I broke off a really dead twig only to have two small larvae fall out on the path. I suppose these were about 7mm long, whitish, and with the heat on the path wriggling like mad things. They quickly disappeared into some grass, and to be honest, because I was so hot, and I thought they were probably some wood-boring beetles, I couldn't be bothered looking for them. In hindsight I've been kicking myself ever since. Anyway, back to the plot. I walked on, and finding absolutely nothing, I returned to the spot and thought I may as well get a couple more, rather than go back empty-handed. I broke off a few more twigs and branches, and as I looked around, the middle-sized holes began to look a little familiar. I don't know why, but the twigs with these holes just reminded me of the really old dead snappy twigs of blackcurrant. I looked down, and literally not nine inches from my nose on a tiny new shrub of *Oleander*, on a leaf, were a male and



female clearwing, paired up in the blazing sunshine. I immediately potted them. Absolutely wonderful! There are a few special moments which will live with me forever, and this was one. I suspected at this moment that the holes I'd been looking at were indeed from clearwings, and I'd just lost two larvae! Anyway, with a male and a female you can imagine my delight. With all I'd learned by observation on the other species at home, I could see that these holes were indeed workings of clearwing larvae. Well as near as I could hope to be. With that I carefully dismantled the dead pieces but found no more grubs. However, the locations and size of holes were exactly like those of the Currant clearwing. I found no old pupa cases but guessed that with the extreme heat and dryness, these would be quickly blown away by the sea breeze.

I took the adults and a bagfull of twigs and branches back to the apartment where I carefully sawed them into nine-inch sections. I found a glass fruit bowl and upturned it on the table with the clearwings and the supposed foodplant inside. The female then immediately started carefully walking along the cut sections (I found some slightly younger twigs) and began dragging her abdomen over the surface, looking for a suitable spot to lay her eggs. This she did, either in cracks in the thin bark or the broken ends of the twigs where I'd snapped them off.

I brought pieces of these twigs and branches back with me in the hope that the eggs may hatch and the larvae go into the twigs. Also some of the snappy dead pieces which may contain larvae already. On looking round the bushes I found no holes at all on younger twigs. All the holes I saw were on really dead pieces. Of course in such a hot climate once the twigs begin to die, it may be a quick process for them to dry up and crack, so the withered pieces might not in fact be that old. Of course I'm guessing here, as with everything else, but to me most of the fun is trying to guess what happens with these lovely moths, from what you see in the field.

Rob set the two moths on my return, and by a process of deduction we found out which species they were. Checking in Rob's European book on Sesiidae, we looked up the foodplant, which Rob saw to be tamarisk. There was only one species under this heading, and it was *Synanthedon theryi*. A sketch and photograph matched my pair exactly, the species only being recorded from Spain apparently. I suppose this would include the islands as well, but on this point I'm not sure. The moth is about the size of a large Currant clearwing, and heavily banded with black and yellow. I live in hope that something occurs with all the



twigs but to be honest it may be a long shot, given that the conditions here in my room don't exactly match those on a wildly hot, breezy beach on the Menorcan seafrent. Then again, with my luck sometimes you never know!

Prees Heath and Brown Moss, Shropshire, revisited, 1999

by Jan Koryszko (6089)

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It has been two years since we visited Prees Heath and Brown Moss in Shropshire (see *Bulletin* 421: 222-223). On 1st August 1999 Charles Byatt, Derek Heath and myself arrived at Prees Heath at around 11.30am. The day was very hot, sunny and humid, by midday the temperature was in the mid-80s. We encountered Small skipper *Thymelicus sylvestris* Poda, one worn Large skipper *Ochlodes venata* Thompson and a number of Small heath *Coenonympha pamphilus pamphilus* Linn., Meadow brown *Maniola jurtina* Thompson, Gatekeeper *Pyronia tithonus britanniae* Verity, Small copper *Lycaena phlaeas phlaeas* Linn. and also Common blue *Polyommatus icarus icarus* Rottemburg. We netted one male Silver-studded blue *Plebejus argus* on heather, which we released after identification. Around the oak trees we saw around six Purple hairstreaks *Quercusia quercus* Linn. and Speckled woods *Pararge aegeria tircis* Butler were in small numbers along with one Pyralid moth. I then beat out a Four-dotted footman *Cybosia mesomella* Linn. which seemed quite sluggish.

We were sorry to see that quite a bit of garden refuse, some fairly large trees and tin cans had been dumped on the heath – no doubt this will affect the habitat in the future if it is not removed.

We then moved on to Brown Moss. Dragonflies were plentiful here. The Brown hawkler *Aeshna grandis* Linn., Common hawkler *A. juncea* Linn., Common darter *Sympetrum striolatum* C., Ruddy darter *S. sanguineum* Muller and quite a few Blue-tailed damselflies *Ischnura elegans* were all recorded.

The Peacock butterfly *Inachis io* Linn. was plentiful along with Green-veined white *Pieris napi*. In the damper parts of the Moss I also noticed a good growth of water forget-me-not *Myosotis scorpioides* but it may have been one of the several other closely related species of water forget-me-not.

The commonest moth in the area was the Silver ground carpet *Xanthorhoe montanata montanata* D.&S. beaten out of the bushes. At 3.00pm a heavy thunderstorm moved in so we made for home.



Ladybird survey

In 1998, Irene Geoghegan at the Scottish Crop Research Institute, Invergowrie, Dundee received £13,900 to enable her to continue with important research into ladybirds in Scotland. She began her research in her own time without any funding but was given an award by the Royal Society and British Association Millennium Awards Scheme to help fund a survey of the 7-spot ladybird in Scotland, which is under threat from a small parasitic wasp, *Dinocampus coccinellae*.

The ladybird, the most attractive and popular insect, is a friend to farmers and gardeners. The spotted red and black creatures don't sting and they devour huge amounts of aphids. Each ladybird can eat 5,500 aphids in its lifetime. Aphids can cause economic losses in excess of £100 million a year to British agriculture. Eliminate ladybirds from the pest control equation and you face one of two equally undesirable scenarios, a plague of aphids or total reliance on chemical pesticides and a resultant increase in growing costs.

Unfortunately there is a little "fly" in the ointment, because the 7-spot ladybird is under threat from a native parasitic wasp, alien style. Most wasps are female, though males do occur rarely. Each female wasp lays between 100-200 eggs, has two generations a year, and is therefore capable of killing 10,000 ladybirds during this period.

The interaction of the wasp with the ladybird seems cruel and ironic. The wasp lays a single egg inside the ladybird and the larva develops by hijacking the nutrients from her host. When the larva is fully developed she severs the main nerves to the legs of the host, effectively paralysing the ladybird. She then burrows out through the body wall and makes a silken cocoon between the ladybird's legs. It's cruel but smart as well - the ladybird is a living incubator and the larva is also protected from predators by the ladybird's bright, warning coloration and foul-tasting yellow fluid until she emerges as an adult from the pointed end of the cocoon, ready to infect her first victim. The fate of the ladybird, which has remained alive throughout this ordeal, is now death, either by starvation or fungal infection.

For the last two years, a major Scottish 7-spot ladybird survey has been looking at the rate of parasitism. At the same time, the survey has been identifying which different species of ladybirds can be found in Scotland, so that species identification maps can be updated. Part of the millennium award was used to produce yearly information packs to send out to schools and the general public to enlist their help in collecting the ladybirds from all over Scotland.



The results from the 7-spot ladybird survey showed that the wasp is multiplying alarmingly in Scotland, so much so that some parasitism rates are now over 60 per cent, where normal acceptable infection levels are less than 20 per cent. Next year a final survey will be run in Scotland, enabling three years of results to be collated.

This project has been scientifically very informative and has produced several scientific publications and posters, which have been presented at home and abroad. It has also engendered considerable public and media interest and articles have been on national TV and radio and in countless newspapers and magazines. It was because of this coverage that Techniquist Science Centre in Wales heard about the problem in Scotland and began to wonder if a similar situation might be occurring in their country. Therefore in 2000, Techniquist will run a similar "Ladybird Spot-Checks" survey, enlisting the help of the public to look at the parasitism of the 7-spot ladybird in Wales. Also the research has prompted the UK Wild 2000 and the BBC's Natural History Unit to join forces to help and therefore enable a nationwide survey to be carried out.

The Scottish project would not have been nearly so successful without the many visits made to schools and other institutions to encourage people's understanding of science and build community partnerships by allowing the public to become involved in actually helping to shape the project. It was mainly because of this interaction with school children, and to encourage them to gain more knowledge about the world around them, that a video was produced, in-house at the Scottish Crop Research Institute, all about ladybirds ("Ladybird Spot-Checks"). The video is an excellent teaching aid, being both informative and fun, and fits in well with the school curriculum.

If you are interested in becoming involved in the surveys or would like more information, contact:

Scottish Ladybird Survey

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British Bees and Wasps

by Theodore Wood, F.E.S.,

Author of "Out with a Sweep-net," etc.

A historical account submitted by Brian Gardiner (254)

Very few of us have the smallest idea how many British bees and wasps there are.

We speak of "the" hive bee, "the" humble bee, and "the" wasp; and we possibly include the hornet. But we seldom realise that two out of the four are merely family titles, which we bestow impartially upon a large number of species.

Now there are really a great number of British bees, and a fair number of British wasps. There are social bees and solitary bees, burrowing bees and boring bees, nest-making bees and parasitic bees; and, in the same way, there are social wasps and solitary wasps, burrowing wasps and boring wasps, building wasps and non-building wasps. And, as both bees and wasps burrow in various ways, bore in various ways, build in various ways, and feed in various ways, the study of their habits and history is an occupation which may well last a man for a life-time.

Let us begin with the bees, passing over the hive bee altogether as being a kind of domesticated animal, no longer living in a state of nature. And first let us see something of the solitary bees.

These differ from the social species in a very important particular, for there are no "workers" among them to ease the female of her labours, and leave her free for the all-absorbing task of egg-laying. Males and females only are born, and as no nests are made, no combs fashioned, and no stores laid up, they are not nearly such interesting creatures as some of their social relations. Still, however, there is a good deal to be learnt about them, and the habits of one or two are very curious indeed.

There is *Halictus rubicundus*, for example, which makes a tunnel in the ground with a number of chambers opening out from either side of it, in each of which an egg and a liberal supply of pollen – or "bee bread" – are placed. There is *Andrena convexiuscula* (I must apologise for using all these Latin names, but as most bees possess no English ones, what am I to do?), which is greatly persecuted, like some of its relations, by a little beetle called the *Stylops*, which burrows into its body, and there lives quite happily. Whether the unfortunate bee is equally satisfied is another question. *Cilissa haemorrhoidalis* can't get on, it seems, without bluebells, which it honours with its exclusive



patronage; and *Dasygaster hirtipes* is a kind of apiarian Esau, clothed as to its limbs with long and shaggy hair.

Then there are a group of bees whose delight it is to lay their eggs in other bees' nests, and which is so far from possessing no popular title, rejoice in no less than three. They are called Cuckoo bees, from their way of handing over their parental duties to other people; Wasp bees, from their likeness to those interesting insects; and Naked bees, from the fact that they do not possess the brushes and other pollen-gathering apparatus with which most of their relations are provided. These, of course, they do not require, as, taking no care of their offspring, they are not obliged to lay up a supply of food.

Osmia bicolor, representative of a family of ten or so, is greatly attached to empty snail shells, which save it the trouble of burrowing when it wants to lay its eggs. In the extreme point of the shell selected it lays an egg and then builds it in and lays another. This in its turn is built in in the same manner, and so on until the shell is filled up, each chamber being duly supplied with honey and pollen for the inner grub of its inhabitant when it makes its appearance. And the inmates of the outer cells, which are always males, very thoughtfully complete their development first, and allow those within to pass through their empty apartments. Thus each has but one doorway to open. Number one cuts through the outer barrier, and emerges a free bee. Number two breaks through into number one's room, and leaves by the door already provided. Number three cuts a hole in number two's wall, and finds two doors already open. And so on.

Another *Osmia* burrows into bramble stems, and makes a series of cells by scraping out the pith, while a third – a hardy Scotsman – fastens its chambers to the under surfaces of stones. Then there are the Leaf-cutter bees, which burrow into wood, or into walls, or into the ground, and line their tunnels with fragments carefully cut from certain leaves; and the Hoop-shaver bee, which scrapes off the woolly down from diverse hairy plants, carries it off to her tunnel, and makes her cells of it. And lastly there is *Eucera longicornis*, which rejoices in a pair of antennae about as long as those of any two other bees put together.

The Social bees are much more curious.

They believe in "workers", for one thing, and the first idea of the queen when she sets to work at egg-laying is to provide a goodly number of those useful creatures. And when they appear, almost the whole work of the nest is handed over to them. The male, or "drone," does nothing at all; the female, or "queen," lays eggs; and the



workers or "neuters," which are really undeveloped females, make the cells, distil the honey, secrete the wax, feed the young, and combine the functions of builders, purveyors, soldiers, nurses, executioners, and any number of other officials of greater or less importance. And they are undeniable clever creatures. They can sting in right of their sex – for among insects it is only the gentler portion of the community which possess this enviable faculty. They can labour steadily on for hours together, apparently from a mere overwhelming sense of duty, and without hope of reward. They can strike angles as truly as if they possessed a thorough knowledge of Euclid and Trigonometry. And, last but not least, they can bestow the great gift of royalty at will upon the helpless infants committed to their care.

For every grub, until it is three days old or so, is a possible queen; its future state of life depends entirely upon its food and the manner in which it is treated. If it is to be a worker it is dieted upon the ordinary "bee bread." But if it is to be a monarch it is regaled right royally upon a special jelly, its cell is enlarged in correspondence with its exalted rank, and it is tended with a respect and reverence which otherwise would never fall to its lot. And it always happens that if the supply of queens should from any cause fail, the want is made good by the elevation of a number of worker grubs to the higher dignity.

Of social bees we have a good many. There is the Carder bee, for example, one of the great Bumble family, which builds a nest upon the ground of moss, leaves, grass, etc, drawing the materials through her legs very much as a carder "cards" wool. The inside of the nest is lined with wax to render it weather-tight, and beneath this umbrella-like shelter a number of cells are made, and an egg laid in each. These cells are not in the least like those of the hive bee, but are oval, and are laid about at random.

The Wood humble bee burrows into the soil, and lightens her labours whenever she can by taking advantage of a deserted mouse-hole or a natural hollow in the ground. The cells are brown and oval, and are piled carelessly into a rough heap.

The Stone humble bee prefers a stone heap and is much aggrieved if any intruder ventures to approach its habitation. Those who hold that "bumble bees don't sting" are hereby recommended to try the experiment of harrying a nest of this species. The test is a most satisfactory one, and is warranted not to fail. This insect is perhaps more familiar to most of us under the title of the "red-hipped" humble bee.



Then there is a very singular parasitic bee, called *Apathus barbatellus*, which lives in the nests of the Common humble bee, seems on perfectly friendly terms with the lawful inhabitants, and is possibly kept by them as a sort of pet. And, lastly, there is the famous Hive bee itself.

On this, however, our space will not allow us to linger, and so we pass to the Wasps.

Beginning again with the solitary species, there are only two which call for special mention, the first of which is the well-known *Odynerus melanocephalus*. This insect burrows into rose or bramble stems, after the manner of the *Osmia* bee already mentioned, digs out the pith in such a manner as to form a series of cells, places an egg in each, and then sets busily to work to hunt up small caterpillars, to serve as food for the future young. For wasp grubs are far more fastidious in their tastes than bee grubs, and honey and pollen have no charms for them.

The second of the two species referred to is also an *Odynerus*, and is generally known as the Mason wasp. And a genuine mason it really is in a small way, not only digging out tunnels in sandy banks, and pouring out a liquid from its mouth which causes the walls to "bind," but rolling up the sand which it removes into pellets, and forming with them a short tunnel outside the entrance. This tunnel is usually about two inches long, and rather reminds one of the awning which is sometimes put up outside a church door for the use of a bridal party.

Of Social wasps we have but few, and most even of these are known only to practical entomologists. But two at least are universally familiar, one of which is the Common wasp, and the other the Hornet.

Many of us have no doubt made acquaintance with the nest of the former – perhaps also with the stings of its inhabitants. Almost always in a hole in the ground do we find it, generally at the roots of a tree or a decaying stump; and not uncommonly does it attain to dimensions really portentous. As many as 30,000 inhabitants, for instance, may be sometimes found in a single nest. But great results, as we all know, very often spring from small beginnings, and this mighty host, together with the dwelling which it inhabits, owe their origin to the persevering labour of a single queen. Early in the spring she made her appearance, and having pitched upon a suitable spot – very likely choosing the deserted burrow of a mouse or a field vole – set to work to enlarge it to her liking. The next step was to fasten a small pillar of paper – formed by gnawing and chewing decaying wood – to some projecting root in the roof, and at the bottom of this pillar to build a cell. After



this the indefatigable queen built two more cells, placed an egg in each, and then erected a kind of umbrella-like shelter over all three. Then followed more cells, more eggs, and more shelter, the old "umbrella" being periodically cut up and utilised in making a new and a larger. And so on until the industrious queen found herself the centre of a large colony, all engaged in building and in various duties for the commonweal.

Space will not allow us further to enlarge upon the beauties, architectural and other wise, of this wonderful nest, and we will therefore pass to a consideration of its inhabitants.

These, like those of a beehive, are of three kinds – queens, drones, and workers. The latter always make their appearance first, and bear the lion's share of the work of the nest, the delicate duty of egg-laying being thenceforward the principal task of the queen-mother. And it is a curious fact that if this exalted dame should die before the other queens are born, the faithful workers work no longer, lose their appetites, and die.

Provided that no such calamity occur, however, a large batch of queens appear about the end of August, together with the drones, which last are by no means so slothfully inclined as the drone bees. Their task is to clean out the nest as often as required to bury the dead, and generally to make themselves useful. And therefore they are not stung to death by the workers, like their bee cousins, but are permitted to live and labour on until the frost makes a clean sweep of all but the future queens. These lie torpid through the winter in the most sheltered situations which they can find, and those which survive are the nest-makers of the following season.

Very like the common wasp is the German wasp, which may be known by the three black spots which adorn the first segment of the abdomen. This species builds its nests with sound wood instead of decaying wood, and so is rather destructive. The Tree wasp hangs its nest to branches, sometimes those of trees and sometimes those of bushes, and a very delicate and yet weatherproof edifice does it construct. The Norway wasp follows its example, and makes a very similar nest, while the Hornet, giant of the wasp family, affects hollow trees and outhouses, wherein it constructs its abodes of rougher and thicker "paper" than that manufactured by any of its smaller kinsmen.

There is yet much to be said concerning these most interesting insects, their food, their wings, their stings, their ways and doings. But space is limited and editors are stern, and already have I overrun my allotted limits. Yet, even at the risk of drawing upon myself the wrath



of him who presides over these pages, I will occupy just a few lines more, and advise those of my readers who may be in want of an amusing and instructive occupation for their leisure moments to take up the study of our British Bees and Wasps.

Some strange Lepidoptera habits

by Jan Koryszko (6089)

3 Dudley Place, Meir, Stoke on Trent, Staffordshire ST3 7AY.

I was most interested in Stephen Meredith's note, *Bulletin* volume 58, number 426, page 192. Do some moths have a rubber fetish? Over the past 35 years since I started my interest in entomology I have noticed a number of strange observations – here are a few of mine, no doubt other members can add their own observations to these.

In confinement some species lay their eggs freely, On collecting trips I use small containers to bring back species for identification and some moths even lay eggs in these. They have laid on glass, plastic and wood. Without any foodplants hawk-moths do lay eggs, sometimes in odd places. I once had an Eyed hawk-moth *Smerinthus ocellata* Linnaeus, lay eggs on used egg cartons which were placed inside my Robinson m.v. light trap. The female was taken out of the trap and laid even more in an empty container. I reared these to moths.

One evening I noticed a Flame shoulder *Ochropleura plecta* Linnaeus, laying eggs on a sugared post in my garden, I reared the larvae. I have also heard that this species was once found laying eggs on barbed wire. Sometimes, crippled females will lay large numbers of eggs in one spot, species I have noticed are Puss moth *Cerura vinula* Linn.; Eyed hawk-moth *Smerinthus ocellata* Linn.; Poplar hawk-moth *Laothoe populi* Linn.; Garden tiger *Arctia gaja* Linn. and Magpie moth *Abraxas grossulariata* Linn. One stormy evening I found a Dot moth *Melanchra persicariae* Linn. larvae eating a piece of newspaper which had blown into my garden.

No doubt Mr Meredith's observation is odd, but these things do happen to all us entomologists from time to time. Maybe the reason why the car tyre attracted the moth to lay her eggs was because the colour black holds heat. My friend Mr R.H. Heath once found a Fox moth *Macrothylacia rubi* Linn. pupae in an old car hub-cap.

Also of interest are diving beetles that often fly from pond to pond at night are often found on black dustbin bags left out for the refuse men, or on top of black sheeting on lorries which have been parked overnight. Maybe the beetles mistake the colour black as being an expanse of water at night, or could it be the warmth?

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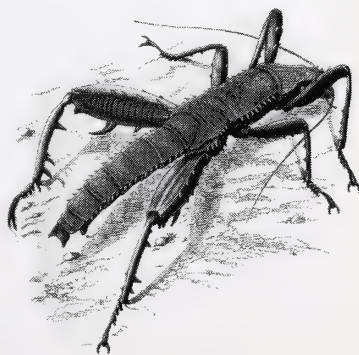
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The Bulletin



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December 2000



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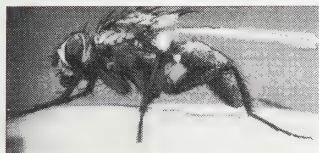
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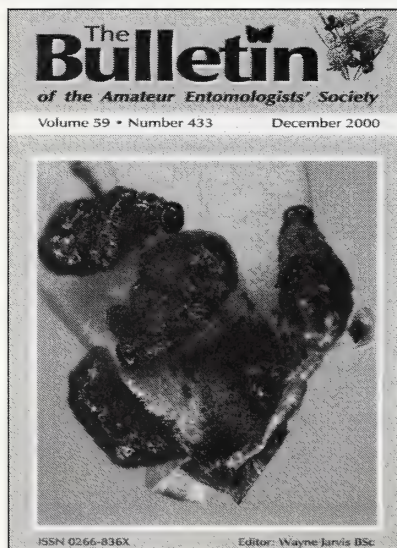
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The cover of the *Bulletin* features several young larvae of the Lily Beetle, *Lilioceris lili*.

The larvae of the Lily Beetle are pale at first, but soon become reddish brown. They are unusual in that the anus is situated upon the back. Their wet, black is produced onto the back of the larva. This appears to act for camouflage and as a deterrent to being eaten by predators such as birds. The larvae feed on the leaves of the food plants for 16-24 days. They then burrow into the soil to pupate.

Photo: Nick Holford.

The Bulletin

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Volume 59 • Number 433

December 2000

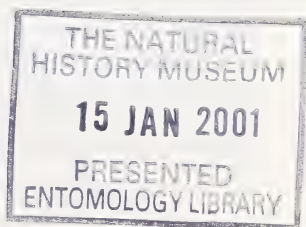
Editorial

In this issue of the *Bulletin* are the reports of the Society presented at this year's Annual General Meeting. The Society's accounts for that period are included in the *Wants and Exchange Sheet*. Indications are that we again shall have a deficit at the end of the current financial year and with this in mind, along with the ever increasing costs involved in producing the Society's publications, you will have noticed that the Council decided to raise subscriptions for 2001. We apologise for this increase, but it is a necessary one and despite the rise still represents very good value for money. It would help both in terms of the time of the Registrar and also in terms of cost to the Society if those members who pay by standing order send an instruction to their bank changing this payment to that indicated on the inside front cover of the *Bulletin*.

Those members who have the luxury of watching satellite television, may have noticed that the Society was featured prominently on the 4th and 19th December on the Discovery Channel's Animal Planet station. The society received well over an hour of publicity as the footage recorded at the annual exhibition was shown as links between programmes. For those of you who are thinking already about the 2001 event it will take place at Kempton park on Saturday 6th October. We would still be very grateful to receive any comments positive or otherwise with regard to this year's event so that we can continue to make the event a success.

Finally, all that is left for me to do is to wish you a Merry Christmas and a very happy and prosperous (and hopefully drier) New Year on behalf of the Society and we look forward to seeing you in 2001.

Wayne Jarvis





Reports of the Society

Report of Council 1999

Membership of the Society as at 31st December 1999 was 1748, a 1% decrease on the previous year. This total comprised 1170 Ordinary members (a decrease of 96 on the previous year), 338 Bug Club members, 112 Family, 59 Life, 36 Associate, 18 Complimentary and 15 Exchange. These figures include 97 Overseas members from 29 different countries.

During the year, Council met on four occasions at the Conway Halls in Holborn. The year saw Peter Sutton take over the role of Habitat Conservation Officer from Martin Harvey, who had set up the Area Reps scheme during his time with the Society and also Peter May, who stepped into the shoes of *Wants and Exchange* Editor. The Council is reaching the stage where more help is needed if the Society is to flourish and any offers of help would be welcomed.

The AGM and Members' Day was held once again at the Natural History Museum and was very well attended. The other main event of the year was the Annual Exhibition at Kempton Park Racecourse, in October. This year the Society held the event over two main floors and this proved to be highly successful. Media coverage from ITV, BBC News 24 and BBC Local Radio also helped to raise the profile of the Society. Thanks as usual must go to those members of the Society who helped during the day to make it the success that it was.

The Society's publications, the *Bulletin* and *Bug Club Magazine* were produced six times during the year, and *Invertebrate Conservation News* also made three appearances during the year.

The Society's Ansorge Award for best Junior exhibit at the exhibition was presented to Philip Crisp for his entomological display and the other main award, the Hammond Award for best *Bulletin* article was presented to Hewett Ellis for his article on Hymenopteran parasitoids.

The AES / English Nature Slide Pack saw its second issue during the year and sales are still going well. A further pack is planned in the very near future. The AES Website continued to grow during the year and is slowly attracting new members along with the more established Bug Club site.

Finally, it is with regret that we announce the deaths of the following members during 1999: Mr R. Hargroves (3777), Mr M.O. Harvey (7916), Mr D. Holton (8668), Mr G. Knight (10332), Mr G. Pirie (10233), Mr R. Shuter (10187), Mr M. Taylor (7715) and Mr C. Wakeman (3162).

Wayne Jarvis, Secretary



Treasurers Report for the year ending 31st December 1999

The last year was a fairly difficult one for the Society with the General Fund deficit increasing from £851 to £4412. In consequence the value of the General Fund fell from £9892 to only £5480. The main reason for this increased loss was a reduction in the capital gain of the Society's investments but membership income was also down as was the profit from the Annual Exhibition. Another problem for the future was an increase in postage rates during the year (over 10%) for all the postal weight bands in which the *Bulletin* and other publications fall. This will have a fairly significant impact on membership fees and on the cost of all our publications.

The Society published a superb new handbook on Stick and Leaf-insects in 1999 which resulted in a substantial increase of over £2500 in the value of publications sales. However the publications fund also suffered from a poorer investment performance and in consequence the trading surplus to the Publications Fund fell from £6055 to £3262. Several new publications are currently being written and four existing handbooks are running low on stocks for which a programme of updating and reprinting is in hand. Sufficient funds are available to meet the costs of printing both the new and revised handbooks.

R.A. Fry Hon. Treasurer

The accounts of the Society for 1999 can be found on the Wants & Exchange Lists No. 232, December 2000

Conservation Report for 1999

National representation

The Society was represented at all meetings of the Joint Committee for the Conservation of British Invertebrates (JCCBI), including those of its Executive Subcommittee. An AES representative, David Lonsdale, was appointed as covenantor of the latter and also stepped in as organiser of the two main meetings amid continuing organisational difficulties.

Following the publication of a code for collectors of fungi in England, Scottish Natural Heritage commissioned a scoping study to assess the value of a suggested code for commercial mushroom pickers in Scotland. David Lonsdale was able to attend a discussion in Grantown-on-Spey, with financial support from the British Mycological Society and with a remit to represent the interests both of fungal and invertebrate conservation. A draft code was produced and a final version should be published in 2000.



Another publication discussed by JCCBI was its set of guidelines on invertebrate site surveys, which dates back to 1992. As the guidelines had appeared only as a magazine article, it was agreed that they should be published by the AES as a stand-alone item. Permission for this was kindly granted by *British Wildlife* magazine. Copies are available from AES Publications at £2.50 plus postage.

Consultation on the working of the Wildlife & Countryside Act, in which we were involved during 1998, led to the publication of a report under the title "A Review of the Operation of Species Legislation in Great Britain". The report demonstrated a consensus that most species protected under Schedules 5 and 8 of the Act are threatened far less by deliberate killing or collection than by the destruction, degradation and fragmentation of habitats and by the wider threats of pollution and climate change. It was, however, worrying that one or more consultees had reportedly advocated the protection of species by reverse-listing; this would criminalise the collecting of all species, except those that could be shown not to merit protection: for example, because they are "pests".

Funding for invertebrate conservation

Despite previously reported correspondence with Environment Minister, Mr. Michael Meacher, no government support for the voluntary sector in invertebrate conservation has yet been secured. Extra funding has, however, been allocated to English Nature (EN) for work on invertebrates. A major outcome of this will be the appointment of an officer over a three to five-year period to facilitate links between the various national and local organisations involved in Biodiversity Action Plans (BAPs) or in relevant research. It is also hoped that the appointee may also be able to help co-ordinate more general invertebrate survey action in England. An additional temporary post, with joint funding from EN and the RSPB, has been set up so as to develop recovery plans "priority BAP" species that do not yet have Action Plans.

Welcome as these projects are, they are mainly focussed on a very small proportion of our invertebrate species and we still need to seek funds to support invertebrate conservation on a broader front. To this end the JCCBI has agreed that a fund-holding charitable trust should be set up. By the end of 1999, plans were in progress to achieve this through the good offices of the British Entomological and Natural History Society.

Local activities and representation

Following the resignation of Mr. Martin Harvey as AES Habitat Conservation Officer, Dr. Peter Sutton was elected to the post in April



1999 and is now continuing the development of our network of local representatives. He has also dealt with letters from a number of reps. and other AES members, enquiring about the protection and management of their local sites. In due course, we hope to publish some of these local cases in *Invertebrate Conservation News*.

Publications and displays

As usual, we published three editions of *Invertebrate Conservation News*. A number of *ICN* articles have centred on the debate about development of greenfield versus brownfield sites, which was mentioned in last year's report. With the release of greatly increased projections for house building in south-east England, there has been some intensification of this debate, but there remains a widespread and probably misguided belief that brownfield development is always to be preferred.

We also mounted, as usual, a display for the Society's Annual Exhibition and have continued to work towards the publication of a second edition of the much acclaimed *Habitat Conservation for Insect: a Neglected Green Issue*. The re-issue of the educational slide pack was completed and copies were available by the end of the year. It was encouraging to see that the quality of the reproductions is very high. Meanwhile, English Nature has found funding to support the production of a new slide pack, to include four habitat types not covered so far. This is planned to take place in 2000 and a number of AES members will be invited to lend us slides for the purpose.

Conclusions

There are encouraging signs that invertebrate conservation is beginning to attract significant interest and funding. This improvement seems largely due to the influence of Biodiversity Action Plans, which have become a major focus for our work. Meanwhile, it will remain necessary not to lose sight of the many issues that are not being addressed by the BAPs. We hope that the planned charitable trust will go some way towards meeting this continuing need.

David Lonsdale and Peter Sutton





Books on stick and leaf-insects

by Paul D. Brock (4792)

"Papillon", 40 Thorndike Road, Slough SL2 1SR.

I am often asked to recommend books on phasmids – the following list of in-print books may help you to decide whether you wish to purchase books, or request them from a library. The number of publications available may surprise you! Some books may be ordered direct from the publisher (cheapest method), such as AES titles; or from book shops, which can supply many in-print books. Prices vary for some book titles, depending where you obtain them from. Foreign titles are usually much more expensive, as they have to be imported; they may also be difficult to obtain, unless you visit the country concerned. Natural history booksellers supply books to customers worldwide. It may be possible to obtain discounts when ordering via the internet, such as through Amazon.co.uk (for Amazon international sites).

Alderton, D. 1992. *A Step-by-Step Book about Stick Insects*. TFH Publications. Waterlooville, £3.95 (ISBN 9 780866 223492). A beginner's book, well illustrated in colour; short notes on six species and mention of others. 64 pages, hardback, 220mm x 145mm.

Alderton, D. 1997. *Your First Stick Insect*. TFH Publications, Waterlooville. £1.45 (ISBN 1858279079-2). Well illustrated with colour photographs, this budget guide will fully meet beginners' requirements, at a remarkably low price. 33 pages, paperback A5. 1999 version £1.50 (ISBN 1852 79170-5).

Baudin, C. & A. 2000. *L'Élevage des phasmes*. Philippe Gérard Editions. Paris. 80 French Francs (ISBN 2-912521-21-1). A breeders guide, in French, well illustrated with reasonable colour photographs, showing a selection of culture species. 82 pages, paperback A5.

Baudin, C. & A. 2000. *L'Élevage des phasmes*. Philippe Gérard Editions. Paris. 80 French Francs (ISBN 2-912521-21-1). A breeders guide, in French, well illustrated with reasonable colour photographs, showing a selection of culture species. 82 pages, paperback A5.

Brock, P. 1991. *Stick Insects of Britain, Europe and the Mediterranean*. Fitzgerald Publishing, £9 incl. p&p UK., £10 overseas (ISBN 0951093983). Available from Fitzgerald Publishing, P.O. Box 804. London SE13 5JF. A comprehensive, well illustrated guide for the collector, or anyone looking for these insects. 50 pages, with one colour plate, hardback, spiral bound.

Brock, P.D. 1992. *Rearing and Studying Stick and Leaf Insects*. AES. £5 incl. p&p UK., £5.50 to Europe, or by surface mail elsewhere. £6.50 by airmail (ISBN 0 900054 54 9). Available direct from AES Publications. Atlanta.



26a Grange Road, Lawford, Manningtree CO11 2ND, England. A low cost guide for the beginner or more experienced rearer, with detailed notes on 17 species widely bred in captivity and brief notes on over 55 other species. 79 pages with figures/black and white plates. Paperback A5.

Brock, P.D. 1998. *Catalogue of type specimens of stick and leaf-insects in the Naturhistorisches Museum Wien (Insecta: Phasmida)*. Katalog der wissenschaftlichen-Sammlungen des Naturhistorischen Museums in Wien, 155 Austrian Schillings incl. p&p to Europe, 170 Austrian Schillings overseas (ISBN 3-900275-67-X). Available from Naturhistorisches Museum Wien, Schriftentausch, Burgring 7 / P.O. Box 417, A-1014 Vienna, Austria. A detailed listing of this important collection, with notes on Brunner von Wattenwyl and Redtenbacher; a must for the taxonomist. 72 pages, paperback A5.

Brock, P.D. 1999. *The Amazing World of Stick and Leaf-Insects*. AES, £14.75 incl. p&p UK., £16.20 to Europe or by surface mail worldwide, or £19.10 by airmail (ISBN 0 900054 63 8). Available from AES Publications, Atalanta, 26a Grange Road, Lawford, Manningtree CO11 2ND, England). A comprehensive guide to everything you want to know about stick and leaf-insects, suitable for beginners and ideal for specialists. Covers a wide range of subjects including fascinating facts, life history and development, collecting, breeding, preserving, taxonomic studies, notes on species from around the world and fossils. 182 pages with numerous figures/black and white plates + 40 pages of colour plates. Hardback A5.

Brock, P.D. 1999. *Stick and Leaf Insects of Peninsular Malaysia and Singapore*. Malaysian Nature Society, Kuala Lumpur. 40 Malaysian Ringgets. Available from the M.N.S., P.O. Box 10750, 50724 Kuala Lumpur, Malaysia, or from some major book sellers (currently available from P.D.Brock, "Papillon", 40 Thorndike Road, Slough SL2 1SR for £12 incl. p&p U.K., £13 Europe or by surface mail world-wide, or £16 by air mail). (ISBN 983-9681-16-8). A comprehensive text with keys to genera/species and numerous figures. This book is suitable for beginners, taxonomists, collectors and rearers. Paperback, 250mm x 185mm – attractive colour cover of *Heteropteryx dilatata*; 222 pages, including 10 pages of colour plates.

Brock, P.D. 2000. *A Complete Guide to Breeding Stick and Leaf-Insects*. TFH Publications, Waterlooville, (ISBN 185279124-1). This book has comprehensive notes on 12 commonly reared species, numerous colour photographs of these and other species. Suitable for the beginner or more experienced rearer. 64 pages, hardback.

Flückiger, P. & Peltier, M. 1989. *Gespensschrecken*. Naturmuseum Olten. Price varies [German text]. A French translation *Phasmes* was published at 8 Swiss



Frans by Naturmuseum Olten & Musée d'histoire naturelle Neuchâtel, Switzerland in 1993. Contact Musée d'histoire naturelle, Rue des Terreaux 14, CH-200 Neuchâtel, Switzerland for availability. A basic, well illustrated guide published to accompany exhibitions on phasmids. Colour paintings of *Heteropteryx dilatata*, 24 pages.

Floyd, D. 1987. *Keeping Stick Insects*. Floyd Publishing, Bottesford £6.50 (ISBN 0 9512466 0 7). A basic breeder's book by an entomological dealer, with notes on seven species, some figures and a few colour illustrations. 60 pages, paperback.

Frost, H. (in press – due 2001). *Walkingsticks (Insects)*. Pebble Books/Capstone Press. 13.25 US Dollars (ISBN 073670854X). Childrens book, aimed at 4-8 year olds. 24 pages, paperback.

Green, T. 1997. *Walking Sticks (The New Creepy Crawly Collection)*. Gareth Stevens. 19.93 US Dollars (ISBN 0836819179). Childrens book, hardback.

Hartley, K., Macro, C. & Taylor, P. 2000. *Bug Books: Stick Insects*. Heinemann Library. Price £8.99 hardback (ISBN 0431016593) or £4.99 paperback (ISBN 043101661X). Simple questions, colour photographs – designed for primary schools, 32 pages. Some information is inaccurate. However, there are some interesting pictures, including one of a native boy from Papua New Guinea eating a *Eurycantha* male.

Langlois, F. & Lelong, P. 1998. *Phasmatodea de Guadeloupe*. Asper; La Guadeloupe Parc National. For price and availability contact P. Lelong, Le Ferradou No. 3, F31570 Ste Foy D'Aigrefueille, France. Well illustrated with line drawings; text in French. 88 pages + appendices, paperback.

Lelong, P. & Langlois, F. *et al.* 2000. *Phasmatodea de Martinique*. Asper. 130 French Francs. For exact price and availability contact P. Lelong, Le Ferradou, No. 3, F31570 Ste Foy D'Aigrefueille, France. Text in French.

Lipinski, K., Greven, H., Schulten, D & S. Löser. 1999. *Die Struktur der Eihüllen von 48 Phasmatodea-Arten aus der Sammlung des Löbbecke Museum und Aquazoo Düsseldorf*. (The structure of the egg chorion of 48 Phasmatodea species from the collection of the Löbbecke Museum and Aquazoo Düsseldorf). Entomologische Mitteilungen aus dem Löbbecke Museum und Aquazoo Düsseldorf. Electron microscope studies; text with several errors in the names of species. Paperback, A5, 125 pages, three tables, 49 black and white plates. Available from Löbbecke Museum und Aquazoo, Bibliothek Frau Enders, 40200 Düsseldorf. Germany. Price 40DM.

Merrick, P. 1997. *Walkingsticks: Naturebooks Series*. The Childs World Inc. Hardback (ISBN 1-56766-384-4) 22.79 US Dollars. For ages 9-12. a basic



32 page information book, with attractive colour photographs, especially of *Diapheromera femorata*. Some information is inaccurate and there is no culture advice. Rather expensive.

Okada, M. 1999. *Nanafushi-No-Subete* (All About Japanese Stick-Insects). Tonbo-Shuppan Publishing, Osaka, Japan, 1,800 Japanese Yen + tax (ISBN 88716-114-X C8745). Currently available from P.D. Brock, 40 Thorndike Road, Slough SL2 1SR for £16 incl. p&p U.K. (enquire for cost outside U.K.) Paperback, 26cm x 18cm, 56 pages (text in Japanese), covering 18 species with many colour and black and white photographs.

Potvin, J. [Not dated – but published in 1996]. *Phasmatodea*. Privately published – £35 including p&p. Many black and white drawings of dead phasmids. A few copies left; available from J. Potvin, Brusselbaan 7, 1600 St-Pieters-Leeuw, Belgium.

Richardson, A. 1998. *Walking Sticks (Bugs)*. Smart Apple Media, Mankato, Minnesota. Hardback (ISBN 1-887068-37-6) 22.60 US Dollars. For ages 8-12, this is a basic 32 page information book, with attractive colour photographs of mainly USA species/culture stocks. Rather expensive.

Richardson, A. 2000. *Exploring the World of Insects: Stick Insects*. House of Stratus. Paperback (ISBN 1-842322095) £4.99. 32 pages.

Salmon, J.T. 1991. *The Stick Insects of New Zealand*. Reed Books, Auckland. 39.95 New Zealand Dollars. This comprehensive book has beautiful water-colours. 124 pages, hardback.

Schoeman, A.S. 1985. *Praying Mantids and Stick Insects*. De Jager-Haum, Pretoria [part of the Insight series]. Current price not known (ISBN 0 7985 1368 8). Obtainable in South Africa and from some specialist book dealers. A basic guide, illustrated in colour. 47 pages, hardback 248mm x 175mm.

Schulten, D. 1995. *Wandelnde Blätter, Stab-und Gespenstschrecken*. Entomologische Mitteilungen aus dem Löbbecke-Museum + Aquazoo, Düsseldorf, DM40. Available from Löbbecke-Museum + Aquazoo, 40200 Düsseldorf, Germany. A useful breeder's guide, in German. 132 pages (including numerous figures) + eight colour plates. Paperback A5.

Seiler, C., Bradler, S. and Koch, R. 2000. *Phasmiden*. Pflege und Zucht von Gespenstschrecken, Stabschrecken und Wandelnden Blättern im Terrarium. Bede, Ruhmannsfelden. 49.80 German DM (ISBN 3-933646-8-8). A large, well photographed book in German covering many species cultured in Europe. Good coverage of eggs also. 143 pages, A4.



Seow-Choen, F. 1997. *A Guide to the Stick & Leaf Insects of Singapore*. Singapore Science Centre, Singapore. 5.15 Singapore Dollars (ISBN 981-00-8628-8). [rarely offered by European book dealers, but readily available in Asia – at time of writing available from Fitzgerald Publishing, P.O. Box 804, London, SE13 5JF for £9]. A delightful little pocket book, lavishly illustrated in colour. 160 pages, paperback.

Seow-Choen, F. 2000. *An Illustrated Guide to the Stick and Leaf Insects of Peninsular Malaysia and Singapore*. Natural History Publications (Borneo), Kota Kinabalu. 40 US Dollars (ISBN 983-812-029-4). Line drawings of nearly all species, including several new species. Minimal text. 173 pages, hardback.

Wang, S. 1997. (Book covering phasmids and mantids). Taiwan Provincial Museum (ISBN 957-531-581-2). Well illustrated childrens guide, in Chinese. 63 pages, paperback.

Watts, B. 1991 (paperback version 1995). *Keeping Minibeasts. Stick Insects*. Watts Books, London, paperback (ISBN 0 7496 1888 4) £4.50; hardback (ISBN 0 7496 0604 5) £6.99. A very basic book for children, well illustrated with colour photographs, 31 pages.

Further titles on Asian phasmids are understood to be in progress.

There is also a video available – *Stick and Leaf Insects. A Novice's Guide to Keeping Phasmids*. GK Video. VHS/PAL. £11.99 incl. p&p. Available from GK Video, P.O. Box 213, Grimsby, DN36 5ZG. A well made 32 minute film, with good advice.

A CD-Rom *Katalog der Phasmideneier* by Rainer Koch and Christoph Seiler was issued in 1999, covering 180 species of phasmid eggs. Cost – in Germany 55DM, Europe 60DM, outside Europe 65DM. Available from R. Koch, Grenzöfer Str. 28, D-69214 Eppelheim, Germany.

2. OUT OF PRINT BOOKS ON PHASMIDS

General information: Prices vary considerably. For example, you might be lucky and find a copy of Clark (which was remaindered soon after publication) in a secondhand bookshop for as little as £1, or pay more than £20 from an established U.K. natural history bookseller who deals in secondhand and antiquarian books (if available).

Details of specialist natural history booksellers can be obtained from useful source booklets produced and periodically updated by the Young Entomologists' Society (USA) and the AES. Alternatively check out Gilbert & Hamilton (Entomology: A guide to information sources.



Mansell Publishing, London; 2nd edition 1990 – although some addresses are now out of date). Try a spread of dealers in different countries – directories from a main library might also be useful if you are visiting other countries. You could try booksearch firms, but I have never had much luck with these and have obtained nearly all the published books from various sources in different countries, over many years. By all means register “wants” with natural history booksellers, who may then give you first refusal if they track them down.

Do not forget to look in general antiquarian and secondhand bookshops (or on the internet), as they may have that elusive title. If you are interested in other natural history subjects also, it can be very enjoyable searching. I once found a very rare volume in a bookshop in Philadelphia, U.S.A. You could also try insect fairs. A few years ago I bought a rare 1893 revision of the Orthoptera by Brunner von Wattenwyl at the AES Exhibition, paying a nominal sum.

Some books may be extremely difficult to obtain, such as Brunner von Wattenwyl and Redtenbacher (1906-08), rarely found outside major museums (one I am still looking for!). In such cases enthusiasts normally obtain a photocopy, or look up details whilst researching in a museum. Older books with hand coloured plates are likely to fetch a premium. The price indications are a general guide only and vary depending on condition of the book. Check that the book is complete, not missing pages or plates, which adversely affects value.

Anon. 1970. *Rearing Stick Insects*. 20pp. AES Leaflet No. 30. The first of the popular guides on phasmids, replaced by Brock 1985. May sometimes be offered for a nominal sum. Also translated into French by Rigout.

Bassler, U. 1965. *Das Stabbeuschrecken-Praktikum*. 88pp. [German text]. Franckische Verlagshandlung, W. Keller & Co, Stuttgart. Paperback, with eight photographs and various figures. Subject matter includes anatomy and physiology.

Brock, P.D. 1985. *The Phasmid Rearer's Handbook*. Amateur Entomologists' Society. Volume 20 (ISBN 0 900054 42 5). Replaced by Brock, 1992 (and title changed). There may be a few copies still available from booksellers for a few pounds.

Brunner von Wattenwyl, K. 1907. In *Die Insektenfamilie der Phasmiden* (Brunner von Wattenwyl, K. and Redtenbacher, J., 1906-1908). pp. 181-338, pl. 7-15. Verlag Engelmann, Leipzig [In Latin with a little German]. Brunner is one of three parts, which are likely to be seen bound in one volume. The combined work is the current monograph on the phasmids, mentioning 1,899



species. Whilst it is a monumental work with 27 useful black and white plates showing a wide range of species, the authors omitted certain key references and described many new species too briefly; despite variation known to occur in some species, many species from the same localities were "separated" by minor features. For a detailed coverage of the type material deposited in the Naturhistorisches Museum Wien, see Brock 1998. Based on my studies of certain genera and the complete fauna of a few countries, I estimate that more than 25% of species described by these authors are synonyms of existing species; many yet to be recorded in the literature. This may prove to be a conservative figure. Whilst researching for my Malayan book, I decided that there were 29 valid species described by Brunner or Redtenbacher out of a total of 103 Malayan species described by all authors. Synonyms identified included the high total of 43 species described as new by Brunner or Redtenbacher.

Rarely seen outside of major museums, if it comes on the market this volume is likely to be expensive, unless you are lucky enough to find a library selling it (the Central Meteorological Observatory in Japan sold off two parts in 1995).

Byron, M. 1988. *How to keep stick insects*. 20pp, paperback. Fitzgerald Publishing, London. May occasionally be found for a nominal sum.

Cappe de Baillon, P. 1931. *Recherches sur la Tératologie des Insectes II*. La Descendance des Monstres de Phasmides. 316pp [French text], 7 plates. Encyclopédie Entomologique 14. Paul Lechevalier & Fils, Paris. A fascinating account of variation within some phasmid species. More likely to be obtained from a specialist bookseller. Expect to pay around £25 to £30.

Clark, J.T. 1974. *Stick and Leaf Insects*. 65pp. Barry Shurlock, Winchester. A much needed book for breeders in the 1970s, which quickly became out of print. Enthusiasts may be able to find a hardback and paperback version for between £1 and £20.

Gray, G.R. 1833. *The Entomology of Australia in a series of monographs*. Part 1. The Monograph of the genus Phasma. 28pp, eight plates, Longman & Co, London. A staff member of the British Museum, Gray was only 25 when this impressive work was published. It covers some of the beautiful larger phasmids found in Australia, with hand coloured engravings by B. Waterhouse, based on original drawings by Charles M. Curtis. Extremely rare.

Gray, G.R. 1835. *Synopsis of the Species of Insects Belonging to the Family of Phasmidae*. 48pp. Longman, Rees, Orme, Brown, Green and Longman, London. This useful publication lists 134 species and several doubtful species, with brief descriptions in Latin. Occasionally offered for a reasonable £15 to £25.



Groupe d'Etude des Phasmes (various contributors), 1993. 48pp, paperback. *Le Monde des Phasmes 1 – Spécial Guyane Française*. GEP, France. A well illustrated paperback guide which will interest researchers of the South American fauna. Possibly old stock still available from GEPAI, c/o 19 Rue Paul Dumont, 62690 Aubigny-en-Artois, France.

Mazzini, M. & Scali, V. (eds) 1987. *Stick Insects: Phylogeny and Reproduction*. Proceedings of the 1st International Symposium on Stick Insects, Siena, Italy, September 30th-October 2nd 1986. 224pp. University of Siena and University of Bologna, Italy. A wide range of papers. Likely to be difficult to find, as the print run was small.

Redtenbacher, J. 1906, 1908. In *Die Insektenfamilie der Phasmiden* (Brunner von Wattenwyl, K. and Redtenbacher, J. 1906-1908). pp. 1-180 (1906) and pp. 339-589 (1908), pl. 1-6 and 16-27. Verlag Engelmann, Leipzig. See Brunner for details.

Sinétý, R. de 1901. *Thèses présentées à la Faculté, des Sciences de Paris*. Recherches sur la Biologie et l'anatomie des Phasmes. 164pp and five plates [French text]. Joseph Van In, Lierre. A very detailed thesis. I obtained one for £10 several years ago, otherwise have not seen it offered. Expect to pay considerably more.



Figure 1. *Tagesoidea tages* (Westwood) from Plate 18 of Westwood (1859).



Westwood, J.O. 1859. *Catalogue of Orthopterous Insects in the Collection of the British Museum. Part 1, Phasmidae*. 184pp., 48 plates, British Museum, London. The first major illustrated work on phasmids in English covers 471 species, many described for the first time. The 48 black and white plates are masterpieces of accuracy. The complete volume was sold at the museum (cost £3 in the late 1800s). When the book was practically out of print in 1902, the Trustees of the British Museum (Natural History) donated sets of plates to museums, libraries and other institutions, which are occasionally sold off. This book is not common, but it has appeared on the market several times in recent years, at £150-£185, and the plates £40 to £50.

3. BOOKS WITH A REASONABLE CONTENT ON PHASMIDS

See sections 1 & 2 for guidelines. The following is not an exhaustive listing, but just a small selection of titles available, concentrating on recently published works which include reasonable sections on phasmids. I have omitted general classification works on the Orthoptera, such as Stål 1875, Kirby 1904 and Serville 1838-39, which are occasionally offered for sale.

A look through general entomology books (including identification guides) in a major library should also help find occasional interesting plates or figures of phasmids. Try also bookshops selling remainder stock cut price, or review copies.

Badenoch, L.N. 1899. *True Tales of the Insects*. Chapman & Hall, London. Phasmids well covered, with various strange stories! May be as found from as little as £2 to £20; definitely one to look out for.

Charpentier, T. de 1845. *Orthoptera descripta et depicta*. 120pp, 60 plates [German text]. Lipsiae, Leipzig. Includes 12 handcoloured plates of phasmids. Very rare, advertised in 1996 and sold very quickly for £800. Consider obtaining photocopies or taking colour photographs of the relevant plates.

Houston, W.K.K. & Wells, A. (eds) 1998. *Zoological Catalogue of Australia. Vol. 23. Archaeognatha, Zygentoma, Blattodea, Isoptera, Mantodea, Dermaptera. Phasmatoidea, Embioptera, Zoraptera*. 466pp. CSIRO Publishing, Collingwood. Victoria. A listing for specialists in the Australian fauna. Available direct from CSIRO Publishing, PO Box 1139, Collingwood, Victoria. Australia 3066 (request leaflet), or listed by U.K. bookdealers for around £85.

Hughes, R.D. 1975. *The Australian Naturalist Library: Living Insects*. 304pp. Collins, Sydney. This well illustrated book includes an interesting chapter on *Didymuria violescens*. Sold for as little as £3 in recent years although now more difficult to find.



- Löser, S. 1991. *Exotische Insekten*, Tausendfüsser und Spinnentiere. 175pp [German text]. Eugen Ulmer & Co, Stuttgart. Well illustrated in colour, including around 20 species of phasmids.
- Marshall, J.A. & Haes, E.C.M. 1988. *Grasshoppers and Allied Insects of Great Britain and Ireland*. 252pp. Harley Books, Colchester. In print reference work on the British Orthoptera, although secondhand copies may also be available.
- Preston-Mafham, K. 1990. *Grasshoppers and Mantids of the World*. 192pp. Blandford, London. Well illustrated guide to Orthoptera, including phasmids. This book has appeared in remainder shops, well below the original retail price of £18.95. Good value.
- Rentz, D. 1996. *Grasshopper Country*. (book and CD). 284pp. UNSW Press, Sydney. An excellent, beautifully illustrated book. In print, price variable depending on where it is purchased. It is possible to buy just the book. I have seen the book and CD listed for up to £61, but shop around for the best price.
- Stanek, V.J. 1969. *The pictorial encyclopedia of insects*. 544pp. Hamlyn, London. Classic example of a lavishly illustrated insects book, not difficult to locate in secondhand bookshops, sometimes for as little as £5.
- Stoll, C. 1788-1813. *Natuurlijke en naar 'T leeven naauwkeurig gekleurde afbeeldingen en beschrijvingen der spookten, wandelende, bladen, zabelspring-baanen, krekels, treksprinkhaanen en kakkerlakken. In alle vier deelen der waereld Europa, Asia, Afrika en America*. J.C. Sepp, Amsterdam. This is a classic book on exotic Orthoptera, with hand coloured plates. The text is in Dutch and French. If you are lucky enough to find even a partial copy of this book, expect to pay about £20 per plate. Issued in parts, you are most likely to come across the 1813 edition published posthumously (edited by Houttuyn). Phasmids are featured on 18 plates. I have seen the complete book available for the equivalent of £2700, so it is worthwhile considering just obtaining photocopies of the relevant text and plates.
- Unno, K. 1989. *The Orchid Mantis and Insects of Malaysia*. 126pp. Nippon Television Network Corporation, Tokyo. Lavishly illustrated with magnificent colour/black and white photographs, with minimal text in Japanese.
- Unno, K. 1993. *Camouflage and Mimicry of Insects*. 87pp. Heibonsha Ltd Publishers, Tokyo. Another outstanding photographic work, with minimal text in Japanese (scientific names provided).



Figure 2. One of Kazuo Unno's books, with an attractive leaf-insect design on the dust jacket.

4. JOURNALS

Although not a book, no serious phasmid enthusiast's library would be complete without a full set of *Phasmid Studies*, which has been issued since 1992 [two issues per year (except 1998, only one)]. In addition, 81 *Phasmid Study Group Newsletters* have been issued between 1980-1999. To obtain details on joining the Phasmid Study Group (which issues both publications), please contact me.

It is likely that many French phasmid enthusiasts will have the publications of Groupe d'Etude des Phasmes, which was active between 1988 to mid-1996 (up to No. 34, all in French). From 1992, the publications were called *Le Monde des Phasmes*.

Phasma has also been regularly issued by Dutch/Belgian phasmid enthusiasts in Dutch.

EDITORS NOTE: Prices were correct at the time of writing. It is advisable to check the current price before ordering.



Some Buckinghamshire butterflies

by Neil McMillan (9424)

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On the afternoon of the 12th July 1999 I visited Bacombe Hill near Wendover in Buckinghamshire to observe butterflies. I particularly hoped to see the Dark green fritillary (*Argynnis aglaja*), which I had seen there the year before. Bacombe Hill is a nature reserve on the escarpment of the Chiltern Hills, and is an area of typical chalk grassland, scrub and woodland.

The day was hot and sunny and I patrolled an area of grassland which contained a large number of thistles. As might be expected, the commonest butterfly present was the Meadow brown (*Maniola jurtina*). The Marbled white (*Mellanargia galathea*) was also very common, as was the Ringlet (*Aphantopus hyperanthus*). I had not been patrolling long before I saw a male Chalkhill blue (*Lysandra coridon*) fly past, which came as a surprise, as I thought it was too early in July for this species. During the course of the afternoon I saw several more males of this beautiful butterfly.

After about ten minutes I saw my first Dark green fritillary of the day. It was great to see this large insect flying powerfully across the hill and settling on a thistle flower. During the rest of the afternoon the Dark green fritillary proved to be moderately common.

Other butterflies I saw that day were: the Small skipper (*Thymelicus sylvestris*), Large white (*Pieris brassicae*), Small white (*Pieris rapae*), Green-veined white (*Pieris napi*), Small tortoiseshell (*Aglais urticae*) and Gatekeeper (*Pyronia tithonus*).

Buddleia

by Andy Joiner (9937)

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Arms arching aflame with royal colours,
Sovereign and sublime on the verdant throne,
A myriad of lustrous winged courtiers
Are drawn to your potent balmy sensors.
Nectar oozing, perfectly created
To intoxicate the hedonistic realm,
Where energised subjects weave fervently
Until life's ambition is satiated.



Letter from Horace St. John Donisthorpe to an unknown correspondent

Reported by Keith C. Lewis (3680)

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Introduction

A few years ago I purchased a copy of the *Illustrated Edition, British Coleoptera* volume 6 by Fowler and Donisthorpe 1913 from a bookshop in Devon. Between the pages 342-343 I found part of a letter that had been typed on very thin paper by Horace St. John Donisthorpe, the well-known coleopterist (1870-1951) to an unknown correspondent. It concerned the genus *Haltica* = (*Altica*) Chrysomelidae. The letter dated 21st July 1944 is reproduced below with text, spelling, and layout, as the original letter. It is possible the correspondent Donisthorpe was writing to W. J. Watts of 42 Bramerton Road, Beckenham, London as his name is written in the flyleaf of the book.

The Donisthorpe letter

"I enclose a list of *Haltica* and their food plants – a collector should note the plant he gets them off. We have two specimens of the true *Haltica tamaricis* in the Power collection and they are quite distinct and not what your friend sent. Bryant, who is an authority, said they were *Haltica oleracea*. The last sent agrees with the *Haltica pusillus* in my own collection, but I don't profess to be great on *Haltica*. The *oleracea* group are most difficult and Dr Sharp made it worse. His *Haltica britteni* I believe is *longicollis*. Oliver Janson said the moment Dr Sharp or Joy took a genus in hand, he gave up studying it, as they made it hopeless!

Haltica coryli. Is green and found on hazel.

Haltica lythri. One only finds on purple loosestrife and it is a large blue beast rather like those first sent by your friend.

Haltica tamaricis Schr. On *Hippophae rhamnoides* (Sea black sallow-thorn and *Myricaria germanica* (Tamarisk? Sweet gale).

Haltica lythri Aube. On *Lythrum salicaria* (Purple loosestrife).

Haltica ericeti All. on heath *Erica tetralix* etc.

Haltica coryli All. (*ampelophaga* Fowler) On young hazels in woods and hedges.



Haltica oleracea L. On *Epilobium mantanner* (Willow-herb).

Haltica palustris Weise On *Helianthermi*? etc, damp places.

Haltica pusilla Duft On *Helianthhemum guttatum* (spotted rock rose) *epilobium*?

Haltica britteni Sharp On Heath, *Erica cinierea* etc.

Haltica ytenenensis Sharp On heather."

Mr Anthony A. Allen who collected with and was a great friend of Horace Donisthorpe writes. "There used to be quite a bit of sniping and backbiting among certain of the old-time entomologists, some of it sheer irrational spite with little or no foundation, and some with a grain or two of truth. Donisthorpe was not above such tittle-tattle and remarks about Dr Sharp and Joy, for instance were typical and unfair considering the important contributions that they made to the study of our beetle fauna, especially Sharp who added much to the knowledge of many groups within the order. Moreover Oliver Janson's alleged opinion as quoted in the letter, whilst possibly amusing is absurd if taken seriously."

The genus *Altica*

The genus *Altica* is one of the most difficult in our British coleopterous fauna. But the important revision by D.K. Kevan of the species in 1962 helped considerably and reduced the number of British species to seven. The name (the true) *Altica tamaricus* was dropped some time after Donisthorpe wrote the above letter, it was found that despite Donisthorpe's opinion it was in fact *Altica lythbri*. Below are the now excepted list, synonyms, beetle's colour and notes. Fig. 1 shows the beetle *Altica oleracea* 3.2-3.7mm that are very variable in colour, most of the group being a metallic blue to green. Thirteen species occur in central Europe.

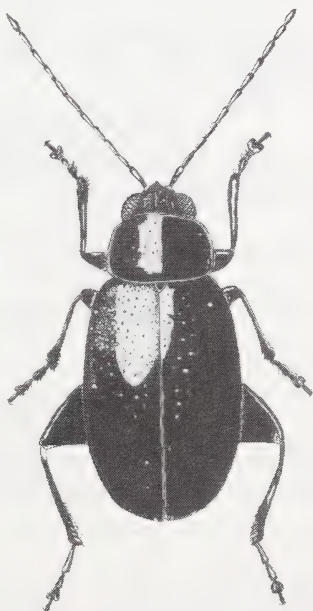


Figure 1. *Altica oleracea*



1. *Altica brevicollis* Fourdras. = *coryli* Allard. On hazel *Corylus*, not common. Green.
2. *Altica britteni* Sharp. Very like number 3. On Heathers, chiefly northern species.
3. *Altica ericeti* Allard. On Heathers, especially common in the New Forest.
4. *Altica lythri* Aube. = *tamaricis* of British authors but not of Schrank. A large common deep-blue species, gregarious on *Epilobium hirsutum*.
5. *Altica oleracea* Linnaeus = *ytenensis*. Sharp. Found frequently but seldom gregarious, principally on rose-bay willowherb and other Onagraceae.
6. *Altica palustris* Weise. On waterside plants such as *Epilobium*. Local and not common.
7. *Altica pusilla* Dufts. Found in chalky districts on rockrose. Our smallest species.

Below are the *Haltica* species listed in the catalogue of British Coleoptera by Dr D. Sharp and W.W. Fowler 1893.

1. *Haltica tamaricis*, Schr.
2. *Haltica lythri*, Aube.
3. *Haltica ericeti*, All.
longicollis, British collection.
4. *Haltica coryli*, British collection.
5. *Haltica oleracea*, L.
v. nigra, Weise.
6. *Haltica palustris*, Weise.
7. *Haltica pusilla*, Duft.
v. montana, Foud.

Acknowledgements

I thank Anthony A. Allen for his comments concerning the Donisthorpe letter and for supplying D.K. Kevan's 1962 revision.

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A ramble through the butterflies of Nottinghamshire

by Martin White (6003)

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What is Nottinghamshire famous for? Well, the city of Nottingham boasts the most beautiful women in the country. This may be due to a large influx of Lysette Anthony lookalikes arriving from France to find work at the height of Nottingham's lace manufacturing industry, then staying put, and passing on their rather good looks to a substantial percentage of the present day female population. Other than this pleasing fact, Nottinghamshire is far more famous for the notion of a particular hooded thief or robber, the mythically named Robin Hood, and his association with the county's shire wood, better known throughout the world as Sherwood Forest. An entomologist unfamiliar with the county could therefore well assume that such a shire, with its suggested arboreal abundance, would always have been home to a plentiful supply of Speckled wood butterfly. This is not so, for it is only within recent times that this insect has increased to become the far from scarce creature it once was. Historically, it has been recorded with note, indeed up to the mid-1980s there were overtly more definite sightings of the "elusive" Purple emperor than of the "ubiquitous" Speckled wood for Notts. Both species have however been subject within the county to the attentions of the introductionists, and the Speckled wood has also benefited from recent expanding establishments emanating from neighbouring shires. It appears that nearly all of this butterfly's successful artificial colonies were initiated at a time when it was experiencing local increases in its natural distribution.

The author of the most expansive one of these establishments seems to agree with this hypothesis. Although it may be worth pointing out that when good numbers of locally originated captive-bred Speckled woods were released at various suitable stations in Notts prior to 1985, a large proportion of these failed to produce even a single further generation, and curiously, it was southern stock or stock with no data, presumably from southern England, which provided the basis for nearly all of the successful later liberations. The most notable establishment, mentioned above, started life close to Doncaster, from Sussex stock, and by 1990 had colonised much of South Yorks, swamping four other introductions along its way, and then it proceeded to swallow-up a goodly chunk of north Notts, including my own back garden. Had it



not been for other expanding colonies blocking its path, at its earlier unassisted southerly advancement rate, my guess is it would have reached Nottingham and beyond by the year 2000. Sorting out which Nottinghamshire Purple emperors are the result of releases and those that are natural or unaided, is however a near impossible task; suffice to say that this species does have a continuous recorded presence in the county throughout the whole of the 20th century, and my gut feeling is that not all these occurrences are the result of liberations or their immediate progeny.

Recording butterflies can be a difficult task, or rather finding someone pleased to publish your results does have its problems in a county with no official recording scheme. This was the case prevalent in Notts prior to 1986, before Wollaston Hall began accepting the output of the county's butterfly enthusiasts. Up until this date one had to make do with sending one's findings to an institute in an adjacent shire. This information tended to be received with a mixed bag of responses. County recorders like to compete with one another for who represents an area with the greatest number of discovered species, so woe befall anyone who records a species not found in an adjoining district and then sends the relevant individual information that his neighbouring shire has an insect he doesn't; they don't like it. Most of the butterfly species currently occurring in Notts also exist or have recently existed in the abutting counties of Lincolnshire and Leicestershire, so hardly any problems manifested themselves with recorders from these shires accepting and acknowledging information. The greater general bulk of Nottinghamshire White-letter hairstreak records have been met with a slightly dubious response in Lincs due to their paucity of similar findings, but otherwise no problems. No, the difficulty lies with South Yorks and Derbyshire, the two adjoining counties which lack quite a few species, or have until fairly recently, lacked species with widespread distributions, which are "unfortunately" present or have spread into or about Notts. The most ludicrous of these must be the common Ringlet, a butterfly always present during recorded history on the eastern and southern fringes of the county, with a single well known outpost about Cotgrave Forest. Tell a Lincolnshire or Leicestershire expert that you've just discovered this species in central or western Notts, and he won't bat an eyelid in disbelief. "What, you mean they don't occur all over your county?", would be a fairly typical response to such a suggestion. Try murmuring a similar accomplishment to experts in Derbyshire or South Yorks, before their counties were totally overrun by this species, and one



found one's credulity open to serious question, with "once you've been doing this for a couple of years you'll start to appreciate there's quite a difference between a male Meadow brown and a Ringlet". On the other hand there are absolutely no problems trying to persuade a Derbyshire expert about a Nottinghamshire Green hairstreak (currently an incredibly rare Notts species) because his county is literally infected with countless thousands of 'em.

It seems that throughout the 20th century Nottinghamshire was populated by people prone to flights of fancy. What isn't widely appreciated however, is that butterflies have been invented for Notts during the 20th century, purporting to have existed during the 19th century. Curiously the authors of such myths, having made their claims, then feel compelled to move to Cheshire. Why this is I cannot begin to imagine. One such authority made the statement that the Large blue was once a Notts speciality. This is a complete load of hogwash – there's not one single scrap of evidence to support such a claim. The book in which this fact occurs is written in some form of gibberish, and what little of it does make any sort of sense is largely false. Should anyone be unlucky enough to discover which publication I mean, it should be quietly disposed of into the nearest bonfire.

Nottinghamshire's truly golden age of butterfly myth and exaggeration belongs, or so it is widely believed, to the 19th century itself. It has been, and must surely still be with some disquiet to those authors, who have peddled the conjecture that the county was once awash with persons inventing butterfly records, to realise that in more recent times quite a few of these mythical creatures have been discovered (rediscovered), spread into, or have been successfully introduced into the county's suitable habitats. Such species include: Chequered skipper, Essex skipper, Brown hairstreak, Brown argus and White admiral. All except one of the other remaining "unicorns" have occurred at one time or another in one or more, or still occur in some of Nottinghamshire's various adjoining counties, and these include: Swallowtail, Wood white, Black-veined white, Large copper, Small blue, Chalkhill blue, Adonis blue, Mazarine blue, Duke of Burgundy fritillary and Large heath. The only exception, mentioned above, absent from all nearby counties, and perhaps also readily confused with another species, is the Adonis blue, an insect that must be considered somewhat improbable, but by no means impossible, given that its foodplant, Horse-shoe vetch, once grew in Sherwood Forest.

The authority responsible for starting a large amount of this supposed codswallop was one William Sterland, who obtained most of his data from the collection and record books of a certain John Trueman of Edwinstowe,



who himself collected and studied the beetles, moths and butterflies of Sherwood from c.1830 to c.1870. It was claimed by John Carr in 1916, that due to the improbability of some of Sterland's records that Trueman must have obtained various specimens for his collection from other parts of the kingdom *i.e.* as it was thought that any species not considered to be present in the county, "at the turn of the century", couldn't possibly have existed here previously (most notably all those butterflies listed in the previous paragraph). This was the sort of ideology prevalent at the time, personified nationwide by a certain Mr Tutt, who according to a certain Mr Alan, "threw out many a baby with the bath-water". Carr wasn't above making further mistakes, and he thoroughly discounted Trueman's best beetle records in his tome on the invertebrate fauna of Nottinghamshire. These ignored records were also verified by another eyewitness, an expert from London, and a Sherwood contemporary of Trueman's, and much later, when they were still found to be present by others, were then treated as fresh discoveries. Sterland's bird records and Trueman's moth records have also come under some attack, and it is this author's modest belief that none of these are beyond the realms of feasibility. Indeed, a good number of Trueman's moth records have been "discovered" over the last 20 years by a certain faction that also insisted Sterland was foolish for accepting Trueman's outlandish record-book claims. It must be viewed with some sterling hypocrisy that these same people pinion their discoveries of the selfsame species, "invented by Sterland", with the mark of distinction of being New County Records.

Large copper? Just whose leg am I trying to pull? Well did you know that it occurred up to the 1860s at Morton Carr in Lincolnshire, and was collected here by a couple of gentlemen, and that the specimens they took still exist? Yet apparently when one of these gentlemen crossed over the river Trent into Walkeringham and likewise captured a few more, albeit Nottinghamshire examples, these butterflies were regarded as bogus. Remnants of this ancient fenland still exist with Great Water Dock still growing within earshot of both sites. If one was to ignore the Nottinghamshire report of this species, one would also have to classify the Lincolnshire one as bogus too, and the Lincs people wouldn't be very pleased about that, it's a fact.

The current occurrence in Nottinghamshire of White admiral is, I'm afraid, a bit of a cheat, because all of its present day colonies and late 20th century sightings are the result of liberations. This doesn't prove that the habitat of this particular unicorn did occur in Sterland's 19th century Sherwood, but still, he does tell us that he met with this species here, on one occasion, which despite the failure of a later observer to find it, seems to add some credence to the earlier records of the "duplicitous" Trueman.



Before one sticks one's head above the parapet exclaiming "we have Brown argus in Notts", it is first essential to make absolutely certain that bumper colonies of this species occur in all the surrounding counties. To record such a species for Notts without this particular safeguard would, as earlier implied, result in resentment followed by contempt and derision from the encircling experts who lacked such a prize. Furthermore, it is most important that the super-sceptics of South Yorkshire have Brown argus which on occasion express the forewing white discal spot, before one can expertly advance the theory that Nottingham has them too. Amazingly, Sterland makes especial note of this precise phenomenon for 19th century Sherwood, and it is very pleasing to announce that this particular unicorn is once again up and dashing hither and thither about the forest.

Mazarine blue and Black-veined white both occurred in nearby Lincolnshire localities, and it is not beyond the bounds of possibility that both these species were once found in "Robin Hood country". Indeed, the former species is recorded for Clumber, and the latter for Thoresby Park. This is of course anathema to the cynic, who would have us believe that the authenticity of these curiosities rests with fraudulent specimens obtained elsewhere.

The most difficult unicorn to explain is Large heath from Sherwood's parched and sandy wasteland. It is upon this record that my argument falters, and a leap of faith is required; perhaps Trueman did purchase his specimens from elsewhere and make erroneous notebook entries which were then later to be repeated by Sterland. Maybe with its downfall, like a house of cards, will fall dead all of the other unicorns? True, Nottinghamshire is surrounded by other counties that claim this prize species, but its foodplant, Cottongrass, has never been recorded in Sherwood's grassy glades. True, the Swallowtail's foodplant is likewise absent, but its continental cousin is now known to migrate from France and this might just easily account for its single reputed 19th century Sherwood Forest appearance. However, the Large heath is not a known migrant, and Sherwood's nearest recorded colony of this species was along a beck (drain?) on or near Gringley Carr at least ten miles distant from the closest point to the forest's outermost edge. Unfortunately this record is in Notts, and therefore somewhat doubtful, so all appears to be lost. Maybe there was a dearth of Sherwood sedge experts during the early part of the 19th century, and Cottongrass became extinct before it could ever be verified extant. Obviously I'm now beginning to clutch at straws. But wait a minute, there are records for bogs in and about Sherwood that supported such plants as *Erica tetralix*, and other associated bogland specialities, which are very unlikely to occur anywhere without the presence of good old



Cottongrass, and therefore maybe, just maybe, might have once supported Large heath in the dim and distant past. Certainly if one cares to take a look around Cheshire's Delamere Forest today, its similarity with Sherwood is striking, and who could now guess that the Large heath was once a resident of this rather dry "southern" forest. This is all very tenuous I'm sure, and the sceptics will have none of it, save someone extracting with an auger, from some peaty Sherwood sump, the long dead remains of Cottongrass plus Large heath, and even this wouldn't be sufficient to prove to them any point whatsoever. It's rather strange to think that the worst sceptics are quite capable of ignoring any hypothesis based on a shortage of facts, yet are even more willing to invent their own theories based on absolutely no facts at all.

During the second half of the 20th century a good few Nottinghamshire butterfly species have increased in density, increased in range, or have been subject to a greater abundance of recorded sightings. Such species include: Small skipper, Essex skipper, Brimstone, White-letter hairstreak, Purple hairstreak, Brown hairstreak, Brown argus, Holly blue, White admiral, Peacock, Comma, Speckled wood, Gatekeeper and Ringlet. Species such as Grizzled and Dingy skipper have held their own, with more records for Grizzled south of Nottingham, and more for Dingy to the north of the city. These two butterflies became quite common in Sherwood during the 1980s, which is quite interesting because Grizzled would at one time have been regarded as something of a lesser unicorn species for this part of Notts. A few non-unicorn species have historically become extinct, and these include: Silver-studded blue, Large tortoiseshell, Marsh and three out of the five "woodland" fritillaries. The first three of these have been subjected to introduction attempts, and of the "tree-loving" fritillaries only Silver-washed and Dark green have been seen with any authenticity. Both have been found spread over a wide range of country, with Silver-washed better represented in the south, and Dark green in northern Notts.

Within fairly recent times the best site to see butterflies in the northern part of the county was Wellow Wood, and the great southern Mecca was always Cotgrave Forest. Wellow is not what it once was, and Cotgrave is now a candidate for the worst wood in the county. This wood and its environs have perhaps received a greater array of introductions than any other Notts area, and quite a few of these persisted for a good many years, and included: Wood white, Purple emperor, Pearl-bordered fritillary, Marbled white, Grayling, and possibly a few others, such as Green hairstreak, Dark green fritillary and Speckled wood, but no precise further details on these extras is forthcoming.



Grayling and Marbled white have also found their way into other parts of the county by similar means, and these like a number of others, already alluded to, seem to have set up permanent residence here. Grayling did however, apparently have a recent native population, recorded on a continual footing between 1956 and 1985. This was in the far north of the shire, and the colony also extended into parts of South Yorks and Lincs and may yet still persist unrecorded to this present day.

Wall brown, is perhaps the only butterfly to show a definite decline in Nottinghamshire numbers during the last fifty years. All the other species, not already remarked upon, which one might care to imagine as being common, are generally distributed throughout the county, as relatively abundant, and have been this way for some time.

In 1992 several large fritillaries were seen at a single station in Sherwood, and these were identified as being High brown fritillary. This record received the attention of a nationally circulated publication, and numerous fingers were pointed towards a discreditable breeder, living somewhere in north Notts (Worksop, I believe), who is apparently very fond of this particular insect, and for generally letting things go. This author had, by kind fortune, already been tipped off by a good friend, and went to take a look-see, and much to his astonishment discovered that they were in fact Niobe fritillaries. Laugh, I could have cried. Best of luck and good hunting.



Staggering!

by Henry Berman (5573)

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My daughter caught a female Lesser stag beetle *Dorcus parallelipipedus* in her conservatory. She gave me the live animal for my class to see. I put it in a jar with two half-drowned carabids. There was also grass for them to climb on and to supply a little moisture.

Within half an hour the Lesser stag had completely demolished and eaten the other two. It also fed voraciously on a little piece of cooked chicken. Have I witnessed a G.M. carnivorous monster or do these beetles normally eat meat?



Evolution – The Modern Obsession

Part 3: Batesian Mimicry

by Nick Brown (9289)

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The principle of Batesian mimicry may be described as follows: a normally palatable prey species (known as the mimic) gains protection from predators by virtue of its visual resemblance to another species which is genuinely distasteful (the model). Birds are assumed to be the important selective predators with reptiles playing a smaller role. Müllerian mimicry is a similar principle where two or more not necessarily related species are equally distasteful and reinforce each others protection by sharing a common visual resemblance. This discussion focuses on the Batesian principle while most of what is said applies equally in some manner to the Müllerian.

The theory of Batesian mimicry is tightly interwoven with the theory of Darwinian evolution. This is evident in many authors' choice of definition. For example Berry (1977) defines Batesian mimicry as when a tasty species "comes to resemble" or mimic a distasteful model. Smart (1985) more brazenly states that harmless and quite palatable butterflies "have evolved" similar colour patterns. The implication is always that evolutionary selective forces have shaped the once dissimilar mimic species to gradually look like the model. Conversely Batesian mimicry is used as an illustration of the practical mechanics of "evolution in action".

But what if the validity of Batesian mimicry could be called into question? If there were doubts about the practical reality of Batesian mimicry when its comfortably supportive roll in evolutionary theory would also be subject to doubt.

The idea of Batesian mimicry seems logical and credible, and it appeals to the human intellect. However, if we examine the broader ramifications there arise several theoretical controversies. First there is the assumption that predatory birds cannot tell the difference between the supposed mimic and the model. There are two aspects to this, number one: birds may not perceive the butterflies in an identical manner to the human eye, and number two: since we humans can actually tell the difference why assume birds cannot? Next there is the obvious fact that there are numerous examples of similar appearance where mimicry could not explain any relationship, where two similar looking species occupy different habitats for example or where neither



is poisonous. In other words two species may appear similar due to some other selective agent or even by virtue of random coincidence. Even if two look-alike butterflies do share an area and one is poisonous and the other not we should not jump to conclusions about evolutionary mimicry. A further crack in the argument is that the supposed poison in the model species may not be offputting to all potential predators, as will be revealed later.

Complex debates arise about how significant an advantage Batesian mimicry might be. A mimic species may turn out to be a victim of its own success if its abundance increased to the level of the model in which case birds would start to associate the coloration with good taste rather than distaste. And then there is the question as to whether vertebrate predation is the main selective agent governing the appearance and survival of adult butterflies.

So much for the theoretics. Now what about scientific observation and experimentation?

H.W. Bates ventured his hypothesis after a collecting trip to the Amazon in 1862. This was a time when Darwinism was capturing scientific imagination and providing fertile ground for new ideas. Bates's theory was ingenious but it seems he never actually saw a bird attempting to eat a butterfly, or at least he never recorded any such instance. Neither did he appear to have carried out any experiments to substantiate his claims (Ford, 1975).

Many succumbed to the attractive theory while it remained unconfirmed in the field. For example E.B. Ford in his chapter on butterfly evolution comes over as a strong proponent of Batesian mimicry but states himself that, "Detailed observations on the extent to which birds eat butterflies are sadly lacking . . ." (Urquhart, 1987). Ford was of the opinion (which continues largely today) that birds are the chief predatory influence on the selection of butterfly colour defence. However his evidence for the universal predation of butterflies by birds is rather meagre and circumstantial. The only personal observation he relates is that of British garden birds picking butterflies off a buddleia bush. But the buddleia is not native to Europe and its hypnotic attraction for the insects is merely a case of offering wild birds an artificial food source. We might just as well hang up a string of peanuts and conclude that blue tits eat peanuts in the wild!

One person who has made a detailed study of a presumed example of Batesian mimicry is the American college scientist Frederick Urquhart. Urquhart was familiar with the well documented relationship



between the North American Monarch *Danaus plexipus* and the strikingly similar Viceroy *Limenitis archipus*. It was, and still is, commonly suggested in both the scientific and popular literature that the Viceroy gains protection from being eaten by birds because of its uncanny resemblance to the bitter tasting and poisonous Monarch. But one thing bothered Urquhart; he had become involved with studies of the Monarch and had come to realise that birds very rarely attempted to catch or eat the butterflies. In fact sightings of Monarchs chasing birds were far more common! If birds never attempted to catch Monarchs how could they ever learn that they were unpalatable?

With his curiosity roused Urquhart studied the results of numerous caged experiments that purported to establish the mimicry theory. He found the majority of experiments to be wanting and discovered that he was not the first person to question their validity. For example the choice of blue jays was odd since they were not truly insectivorous birds. Also blue jays have a habit of regurgitating their food so this is no indication that the food is unpalatable. Wild birds may behave differently in captivity, and so on. Urquhart's greatest criticism was that none of the researchers had bothered to ratify their speculations by observing the reactions of birds to Monarch butterflies in their natural surroundings.

Urquhart got one of his students interested in the subject and persuaded him to duplicate some of the studies done by previous researchers. A series of caged experiments were run using starlings rather than blue jays. The starlings were offered both live and freshly killed Monarchs to see if a) they would attempt to take them and b) they found them distasteful. The result was that the birds caught and ate the fluttering live butterflies (after removing their wings) and did not regurgitate them. The dead ones were ignored. In a further experiment a flock of young starlings were fed exclusively on a diet of grain mixed with ground up Monarchs. In this way the student raised a perfectly healthy flock of birds with no apparent ill effects.

Finally Urquhart was fortunate enough to see a bird catching Monarchs in the wild. While observing Monarchs in Florida he placed a few in the sun to warm them up. This induced a shivering action which attracted the attentions of a black-winged cuckoo. The bird seized the insects and took them to a nearby bush. Later on, a colleague discovered the tell tale sign of a pile of Monarch wings under the same bush and confirmed that the cuckoo was indeed consuming the fare.

So it had come to light that Monarchs were not in any way distasteful to at least two species of bird; and the caged experiments had



demonstrated that far from being poisonous Monarchs were a healthy and nutritious food. Of course if Monarchs are not unpalatable to birds then they could not act as a protective model for the Viceroy. In any case, Urquhart's main argument remains that birds seldom even attempt to prey on Monarchs in the wild therefore the maintenance of a Batesian relationship would seem improbable. The full account of Frederick Urquhart's chapter on Monarch-Viceroy mimicry must be recommended. It is a greatly entertaining and humorous story of one man's exposure of a popular "scientific" fallacy.

As an illustration of how an ingenious theory can persuade the intellectually gullible I have selected this passage from Paul Smart's *Encyclopedia of the Butterfly World*: "possibly the best known example of how closely a mimic species can resemble its model is provided by the North American Viceroy which duplicates the colour and pattern of the Monarch". In the light of Urquhart's discoveries in the authority of this statement seems somewhat diminished!

It would of course be equally naive to propose that Batesian mimicry never once played a role as a survival factor. Its just that the significance of this factor would be difficult if not impossible to assess within the complexities of a tropical rainforest ecology. Sometimes we see in nature simply what we believe. If we have a preset notion about Batesian mimicry then that is what we see, If we have a preset notion about natural selection and Darwinian evolution then that too is what we see.

Having discussed some of the major doubts regarding the reality of Batesian mimicry as a selective evolutionary factor, it is also interesting to examine the theoretical routes by which Batesian mimicry is presumed to have come into being. We can imagine two possible scenarios, one in which the pre-mimic species already somewhat resembled the model species, and the other in which there was little or no initial resemblance. Let's take the first case first because it's the easiest to dismiss.

If we speculate that the pre-mimic species was already fairly close in appearance to the model, then we can say that it only required a relatively small change to kick in the survival benefit, perhaps one single genetic mutation. This seems a very plausible and logical explanation; but there is a contradiction in the reasoning here if we are trying to account for the origin of the mimicry by evolution, and it is this. Clearly the further we postulate that the mimic already resembled the model then the further we are trying to explain the mimicry in terms of the way the mimic already looked and the less credit we are assigning to evolution!



If we now take the case in which it is imagined that the pre-mimic species bore little resemblance to the model then we have a very different situation. What we are proposing here is that the mimic and model were substantially different not only visually but also genetically. In other words there would have been the necessity for several genetic changes to occur before the survival benefit kicked in. Now this case does seem implausible since it is long odds that several different and beneficial mutations would occur in the population concurrently. If only one of the mutations occurred it would be of no selective on its own. Evolutionists try to get round this by suggesting a very gradual selective process that step by step refines the colour pattern of the mimic. But it's hard to see how this process might start in a pre-mimic species that looks nothing like the model. Obviously if a pre-mimic form looking nothing like the model undergoes only a slight change, it will still look nothing like the model! If we regard the tropical rainforest environment (where most of the supposed mimics are found) there are literally scores of butterfly species, many with vague similarities in colour, pattern and behaviour. If birds are going to start selecting on this basis they are going to get confused pretty quickly! In conclusion then it seems highly improbable that one butterfly species would have evolved to look like another on the basis of Batesian mimicry.

There is yet another false assumption made in the theory of how Batesian mimicry is presumed to have come about. While postulating how the mimic species might have evolved, it is conveniently overlooked that the model might do likewise. There's no reason why there shouldn't be a kind of anti-Batesian factor: individuals of the model species that look slightly different may be selected on the basis of their not being confused with the tasty mimic! There's no survival advantage to the model in maintaining its similarity to the mimic, quite the reverse.

In gathering evidence against the implausibility of evolution bringing about Batesian mimicry we must include the obvious detail that no one has actually seen one species of butterfly change its appearance to look like another. Naturally evolutionists argue that, since the change would take countless generations to perfect, no one person could expect to notice it in a single lifetime. Nevertheless, however fast or slow we postulate the supposed selection process to be in order to suit our theories, the fact must be faced that no such change (or beginning of a change) has ever been recorded either in a single lifetime or by the study of specimens collected over the last two centuries.



In coming to summarise the overall picture we can begin to see that Batesian mimicry is an appealing but controversial theory. More conclusively it has not actually been demonstrated to be a significant selective force in any natural environment. On the contrary, an in depth study by Frederick Urquhart on the classically claimed Monarch/Viceroy mimicry confirmed his suspicions that the belief was a complete myth. If the reality of Batesian mimicry is in doubt then its entire implication with popular evolutionary teaching is overthrown, for we cannot use one unproven theory to help prop up another.

Could it be that the whole notion of Batesian mimicry is only imaginary, purely a condition of evolutionary zeal boiling over? Has anybody actually observed birds systematically preying on butterflies in the wild, selecting certain colour types rejecting others, buddleia bushes excepted? Even if Batesian mimicry was found to be a genuine survival factor in some examples it is still hard to envisage exactly how Darwinian evolution could have had much to do with bringing about such a relationship if we think through the steps carefully.

Bearing in mind that there are about twenty thousand species of butterfly worldwide, the evolutionist is challenged to consider what selective agents may have brought about the extraordinary diversity among colour patterns rather than what agent might have made a few of them appear similar. What selective force for example caused one butterfly to be black with red stripes and another to be blue with orange spots? We simply cannot logically explain this bazaar menagerie in terms of Darwinian evolution without resorting to the wildest of speculations.

I leave you with some simple advice passed on by Urquhart: "Don't naively accept the opinions of others, with respect to a controversial subject, as gospel truth, as qualified as it may appear on paper". Urquhart applied this wisdom to Batesian mimicry, it's a shame he didn't take it a state further and question the whole dogma of Darwinism.

In the concluding part of "Evolution - the Modern Obsession" the discussion will lead onto human effect on insect species diversity.

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Evolution? Not the Peppered Moth!

by Tony Freeston (11116)

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I would like to make a few comments on the article "Evolution – the modern obsession. Part 2: The case of the Peppered Moth re-examined". Vol 59: 429 April 2000

I do not pretend to be an expert on evolution, as perhaps my comments will illustrate, but I do not believe that some of the comments of Nick Brown should go unchallenged. It is clear from the start that he does not want to see the case of *Biston betularia* as a case of evolution. Why this should be I am unclear. One of the methods he uses is to try a redefinition of the term evolution. Unfortunately the new definition is not a definition of evolution at all. He says that evolution could be redefined as . . ." the appearance of uniquely new genetic material in a species gene pool that previously did not exist". Now this is not a definition of evolution but of mutation. Otherwise where does this material come from. Today I am fly X. Suddenly overnight from somewhere I know not where, I get all these mutations. Thank God they are viable and unique. I am a new species. I think we are in a bit of a muddle here.

A species is seen nowadays as a group of individuals, that can breed but contain within the members of that species variability. All the time one can assume that uniquely new genetic material is being thrown up by mutation. In the case cited, the black form of *betulaira* may well have existed, prior to the advent of industrialisation. But it had a grave disadvantage. Only when the landscape altered to this animal, could this gene type become dominant in the gene pool. The organism adapted to the new conditions. There was enough variability within the species to allow this to occur. Research has suggested that the larvae of melanic moths (and this is recorded in some 70 species in England alone) are physiologically different to the non-melanic forms. Not only is the gene pool affected in the genes that cause coloration, but other genes as well. If one sees the rise of antelope species with ever-longer legs as evolution, why isn't the moth adapting itself to a new environment seen as evolution. I thought the adaptation of a species into a new species as the environment changed was the whole basis of evolution. It is hardly surprising that speculation has not occurred in the case cited, the whole process has only been going on for less than two hundred years. Even advocates of punctuated equilibrium would not deem this sufficient time.



He also suggests that "the concept of evolution is that there is a general move towards ever more complex and advanced forms". Well I am sorry, but this is just not true. This smacks of determinism. This is the kind of talk that leads to humans sitting on the top of a long ladder and Amoeba at the bottom. The idea also suggests that evolution is directed in a certain direction. Was man an inevitable consequence of evolution. Was consciousness the goal of evolution? What is the goal? Evolution is not like that. Evolution is the adaptation of an organism to new conditions. Parasites have evolved from free living forms. They are clearly degenerate from their ancestors. They lose obvious organs such as limbs etc. and often biochemical pathways as well. How can the speciation of a genus occur, if each member of the genus has to be that little more complicated than the sibling species? They just are not. Are we to say that the Psyllids can all be arranged in an order of complexity? They live on different plants, have speciated, but they are not more complicated.

Another of Nick's interpretations of Darwin's evolutionary theories is the notion that the new form is more successful than the old. How is this to be shown? How could you say that one species of trilobite that evolved from a previous species that had existed for tens of millions of years is more successful? The old species does not always die out; it still exists in the areas of unchanged environment. No Mr. Brown, this is not what Darwin was on about at all.

The final point I will raise here is the least important, but worth a mention. Mr. Brown does not see man's despoiling of the natural environment as a natural environmental occurrence. Somehow the animal species *Homo sapien* does not affect this planet naturally. No doubt it was natural for the herbivores to open up the grasslands of Africa. Rabbits cause certain types of vegetation. Ants and termites set up micro ecological systems. All these are natural. But the actions of that special animal man are not natural. If a volcano vents sulphur dioxide or whatever gas they vent and the vegetation dies, is this natural? Or would we call this a "supernatural" event. No Mr. Brown. The moth is under going natural selection in the environment in which it exists. The species contains enough variation, as do all healthy species to adapt, using genes that already exist within the population. This is the beginning of the process of evolution. A process that does not in itself lead to higher and higher forms, until the angels evolve. It is a process which merely allows a bunch of genes to adapt themselves as best they can to an environment, so that they can produce as near as possible the maximum number of copies of themselves. The carrier of



the genes may be more complex, less complex or of the same complexity. The gene carrier will be better adapted to live in that environment. When the environment again changes, which it must do, the gene carrier will either become totally extinct, or form part of its stock generate a new version.



Book Review

Amazon Insects – A Photo Guide

by James L. Castner (2000). Feline Press, Gainesville. 160pp (including 200 colour photographs), 5" x 5.75" (ISBN 0-9625150-1-9). Available direct from Feline Press, PO Box 357219, Gainesville, FL 32635, USA for US\$15 + \$5 postage surface mail or \$10 airmail; or order through a bookshop.

This attractive pocket photo guide has many excellent photographs showing spectacular and strange insects found throughout the Amazon Basin. The final 16 pages feature other arthropods likely to be encountered on tropical forest trails.

This book is intended for naturalists, research biologists, and tourists to the tropics and is a colourful insight on the fauna, showing areas such as camouflage, behaviour and bright colours. 36% of the insect pages feature the Orthoptera and their allies, along with the front and back cover (not surprising as these are the author's favourites). Other orders are reasonably covered. The short text is useful, concentrating on interesting facts and behavioural notes (summarised in Spanish).

The author has made considerable efforts to identify species wherever possible, unlike many previous authors covering the South American insects. Whilst specialists may not agree with a frequent lack of data on even the country where illustrated species are found, there is no doubt that this book fills a gap in the market and is very good value. A delightful, colourful guide to accompany enthusiasts on a trip to the Amazon.

Paul D. Brock



Opportune pupation site by a Smoky wainscot caterpillar

by Hewett A. Ellis (9940)

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The Smoky wainscot *Mythimna impura* Hübner is a common moth found on the wing from late June to mid-August. The caterpillars feed on various grasses, overwinter when small, and mature the following year. Characteristically, the pupa is formed in a flimsy cocoon on or immediately beneath the surface of the soil. The present note records an unusual pupation site inside the cocoon of a Puss moth *Cerura vinula* L.

On 16th June 2000, whilst searching for the borings of Lunar hornet caterpillars in willow at Curry's Point, Whitley Bay (Vice-County 67, Grid Ref. NZ 350752), I found a Puss moth cocoon firmly attached to the sawn upper surface of a willow stump measuring about 0.25 metres (10 inches) in height. One end of the cocoon was open, the Puss moth evidently having recently emerged. On removing the cocoon from the stump the emerged empty pupal case and the caterpillar exuviae of the Puss moth were visible within. To my surprise the dried exuviae was moving! This was due to the presence of a live caterpillar deep in the cocoon alongside the exuviae. I was unable to identify the caterpillar with certainty and the whole specimen was kept in a container with some willow leaves and various grasses as possible foodstuff.

None was eaten and the caterpillar formed a flimsy cocoon of its own inside the more substantial one of the Puss moth. Within this a reddish-brown pupa formed, with the corresponding exuviae at its rear end, on 23rd June 2000. A month later on 22nd July I found a Smoky wainscot moth had emerged from this pupa and escaped into the container from the Puss moth cocoon via the readymade aperture created by the former emerging Puss moth.

It would appear that the Smoky wainscot caterpillar had fed on grasses in the vicinity of the short willow stump and having reached maturity took advantage of the safe haven provided by the vacated Puss moth cocoon, within which it successfully pupated.





Lochwood, east of Glasgow

by Frank McCann (6291)

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I am writing to describe the area of Lochwood just east of Easterhouse and some of the flora and fauna therein.

The area called Lochwood is approximately seven miles east of Glasgow City Centre. It comprises a district which is natural to this part of Lanarkshire. The vegetation is very varied and the fauna is interesting. At Woodend Loch, for example, the water shrew occurs, the loch also contains indigenous species of fish such as pike, perch, brown trout and several other species.

Bishop Loch, also in the Lochwood area, has for instance the freshwater swan mussel, and I used to find various coloured limestones in that area. Between Bishop Loch and Woodend Loch a stream flows which contains various molluscs such as freshwater whelk and small mussels and cockles and interesting water plants. Herons are frequent in the area.

Amongst the Lepidoptera I have discovered, is the Sweet-gale moth larvae in 1980 or 1981. I found a number of Sweet-gale moth caterpillars and a farm-worker said he saw some of them feeding on what he described as "chickweed" at the edge of a cornfield. The plant, I noticed later, was *Persicaria* – I omitted to mention that in my article for the *Bulletin* at the time.

Other caterpillars I have seen in the area include Sallow kitten (on sallow), Miller (on birch), Grey dagger (mostly on hawthorn, but also on birch and oak). Towards the south of the area I have seen on hawthorn, at the southern edge of a wood, two half-grown caterpillars of the Lappet moth, resting on the hawthorn branches about halfway up the tree. That was around 1979.

In summer the Silver Y is rather common and various other day flying moths occur. This area is a place of natural beauty and is maybe overlooked by people as only one minor road runs from Easterhouse to the Lochwood area and beyond. Another interesting moth occurs in the area, I found a full-grown larvae of it September 1979, namely the Iron prominent, and maybe more common is the Coxcomb prominent.

The area is good for studying entomology and as I mentioned, has interesting flora.



The western Algarve revisited – March/April 1999

by Don Dunkin (1487)

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In the June 1993 edition of the *Bulletin* (Volume 52: Number 388), I talked about the butterflies and other creatures to be seen during late November and early December 1992 in that beautiful coastal strip of south Portugal stretching from the west of Lagos, from Praia Dona Ana to the Praia de Luz.

A purpose of the article was also to draw attention to the projected sale of land in this unique part of Europe where nature had seen fit to provide an almost sub-tropical climate together with a number of very special forms of wildlife.

The threat of increased tourism which seemed likely to follow the sale of land also seemed to me to pose a serious threat to this part of the world: a short term gain against a lifelong loss perhaps!

My concern was sufficient to prompt me to write to a senior figure in the Portuguese Government of the day to draw attention to the potential problems, and especially the threat to the beautiful but already endangered butterfly, the Aetherie fritillary (*Melitaea aetherie aetherie*).

My letter was received courteously as is the Portuguese way!

The AES paper attracted attention from a number of conservationists who share with me, a love of Portugal, its people, culture and wildlife.

In 1999, during the period 27th March to 15th April, my wife and I decided to revisit the Algarve to see for ourselves how matters had progressed.

Our first visit to the Algarve was (many years ago) to the area about the fishing village of Alvor. This visit enchanted us and we have since visited many parts many times of Portugal.

Alvor and the surrounding area is now just a tourist spot with hotels and restaurants everywhere (although fishing is still a source of income). New developments still take place however and the strip of rich south-facing grassy meadow-like land bordering the beach has gone for ever. A solitary Speckled wood (*Pararge aegeria aegeria*) and a Small white (*Artogeia rapae*) were noted during a, thankfully, brief visit.

But the attractive silver-blue form of the Common Blue (*Polyommatus icarus*) photographed in 1986 as well as other species noted previously are almost certainly lost to the area.



But our main purpose in 1999 was to see the area west of Lagos, to spend three weeks to explore old haunts, see how the wildlife and flowers had fared, to meet old Portuguese friends, to again enjoy the excellent Portuguese cuisine. What did the visit reveal?

The land parcelled up for sale *had* been sold and developed; work was still taking place here and there. A ribbon of new buildings seemed to stretch from the Praia de Luz all the way to the beautiful town of Lagos. A hotch-potch of white villas in a variety of styles designed not to blend very successfully with the beauty of the western Algarve and seemingly just splashed upon the land!

At Porto do Mos, a new complex of very expensive villas reached towards the sea (leaving just a metre or so of ground for explorers to pass along the cliff-top between Lagos and Luz in one place). New, featureless streets of villas offered scope for walkers to get lost – which my wife and I soon experienced in our attempt to avoid cliff-top walk dangers.

But from Portuguese friends, I was pleased to learn that the Portuguese authorities now limit the height of new buildings, a past problem in some areas such as Luz. Much more importantly, new constructions within 700 metres of this part of the coast are now prohibited although the rules seem to allow for the re-development of existing properties unfortunately.

Building constraints are vital to the preservation of what remains of the wildlife and the authorities need to be supported most strongly in their initiatives!

Tourism has increased significantly; there is more employment in the Service Industries it seems, although some local people at least are hostile to the changes made.

But walks about the cliff-tops revealed that the Cattle egret (*Bulbulcus ibis*) still survives (although the odd weekend motorcyclist seems to delight in chasing them about their feeding grounds as well as stirring up the dust from paths to the annoyance of tourists).

The Bee-eater (*Merops apiaster*) was also seen although not in their old haunts.

And the local authorities have taken steps to reduce damage to the cliff-top walks and flowers from visiting vehicles.

Damage from extremes in climate could be seen in various places – erosion by the winter floods of three or four years ago, with very dry winters such as in 1998/9 which seems to have affected plant life adversely. Paths are very difficult for the unwary in places!

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Thanks to the efforts of the Portuguese authorities, cliff-top butterflies in the area west of Lagos to Luz seem to have coped well.

Against comparable time periods of previous years, the following butterflies were not recorded this time:

- Aetherie fritillary (*Melitaea aetherie aetherie*). The buildings reaching to the sea, immediately to the east of Porto do Mos probably now prevent the territorial extension of this species. Seen as early as 2nd April in 1987 and as late as 27th April in 1990 but weather conditions (high winds from the 13th April) were perhaps the reason for the lack of sightings.
- Spanish festoon (*Zerynthia rumina*). Not seen since 13th April 1987.
- False baton blue (*Philotes abencerragus*) (could be Panoptes blue (*P. panoptes*). A female photographed 13th April 1987, upper and underside but still very difficult to be sure which of the two species!

Species seen previously and recorded again in 1999:

- Scarce swallowtail (*Iphiclides podalirius*). (One worn specimen only. A casualty from foodplant loss?)
- Swallowtail (*Papilio machaon*). Common and widespread.
- Small white (*Artogeia rapae*). Common everywhere.
- Large white (*Pieris brassicae*). Common near gardens.
- Green-striped white (*Eucloe belemia*). Widespread.
- Clouded yellow (*Colias crocea*). Very common, with odd examples of form *belice*.
- Small copper (*Lycaena phleas*). A few in sheltered warm spots.
- Brown argus (*Aricia agestis*). One only on 1st April: worn.
- Common blue (*Polyommatus icarus*). In sheltered spots, widespread.
- Painted lady (*Cynthia cardui*). Much less common.
- Marsh fritillary (*Eurodryas aurinia*). Widespread in hot sheltered areas along the cliffs. Some brightly marked but cannot confirm identical with *E. desfontainii* (despite many photographs).
- Spanish marbled white (*Melanargia ines*). Widespread.
- Speckled wood (*Pararge aegeria aegeria*). In suitable spots.
- Wall brown (*Lasiommata megera*). Local, hot sheltered spots.
- Mallow skipper (*Carcharodus alceae*). Frequent, hard to spot.



Species newly recorded in 1999:

- Holly blue (*Celastrina argiolus*). A worn female in hotel grounds, 6th April.
- Black-eyed blue (*Glaucopsyche melanops*). Photographed 30th March; seen again 13th April. Post discal spots on underside forewing large and specimen photographed seems to be more like *G.m. melanops* and not the *G.m. algerica* photographed in north Portugal.

Conclusions: I remain concerned about the Aetherie fritillary and would be interested to learn that it survives. But it was pleasing to see that despite the regrettable land sales of the early 90s, much is still to be seen of the butterflies and flowers which make this part of the world so special.



The great cockchafer massacre

by Susan Portman (11549)

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My husband (Carl) and I live on the outskirts of a village in Northern Germany. Our house is surrounded by fields growing a variety of crops that are punctuated by small woodland areas.

During the third week in April whilst out walking, I came across the remains of hundreds of dismembered cockchafers (*Melolontha melolontha*) on the floor.

Body parts were strewn about the roadside and pavement in a localised area. I began a search for live specimens – to no avail. I did find many more broken bodies on the paths and verges, but not a single live specimen at all. However this morning (08.05.00) I walked into my kitchen at 08:00 to find a live *Melolontha melolontha* lying on its back fiercely thrashing its legs in the air.

How strange that after all my searching, the only specimen I could find was in my own house! I took it to the local woods and set it upon an oak tree where it began to eat a juicy leaf.

I understand that these beetles have swarmed out of fields where they over-wintered, but can anyone enlighten me as to why I found so many dead?

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